

1. Find out the correct statement -
 - (a) Life spans of organisms are necessarily correlated with their sizes
 - (b) The sizes crows and parrots are not very different, so their life spans are almost similar
 - (c) A peepal tree has much shorter life span as compared to a mango tree
 - (d) Reproduction is essential for continuity of species on the earth

2. Find out the organism with highest life span -

(a) Tortoise	(b) Horse	(d) Fruit fly	(c) Dog
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3. "How organisms reproduce" - depends upon –

(a) Habitat of organisms.	(b) Internal physiology of organisms
(c) Genetic make up	(d) All of the above factors

4. Which of the following parts are used for reg. repdⁿ in pistia-

(a) Runners	(b) Offsets	(c) Suckers	(d) Stolar
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5. Bamboo species Hovers-

(a) Every year	(b) Once is 12 years	(c) Only once in life time	(d) Twice is in 50-100 year
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6. Which of the following is a false statement?
 - (a) All organisms have evolved similar mechanism to multiply and produce offsprings
 - (b) Asexual reproduction is uniparental
 - (c) Sexual reproduction is biparental
 - (d) In asexual reproduction no fertilization occurs

7. Asexual reproduction is common -
 - (a) Among single celled organisms only
 - (b) Among plants only
 - (c) Among single celled organisms, plants and all animals
 - (d) Among single celled animals, plants and animals with simple organizations

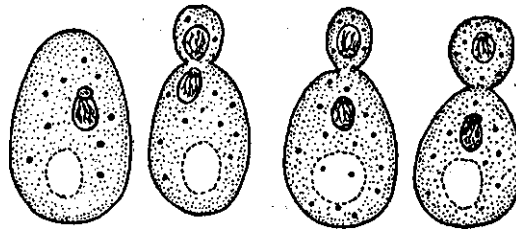
8. Seeds are called products of semual reproduced because they-

(a) Give rise to new plants	(b) Are formed by fusion of gametes
(c) Can be stored for a long time	(d) Are formed by fusion of pollar tubes

9. The chromosome number in Laploid in-

(a) Gameter	(b) Zygote	(c) Seed	(d) Embargo
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10.



The above figure refers to which type of reproduction in yeast?

- (a) Binary fission (b) Budding (c) Layering

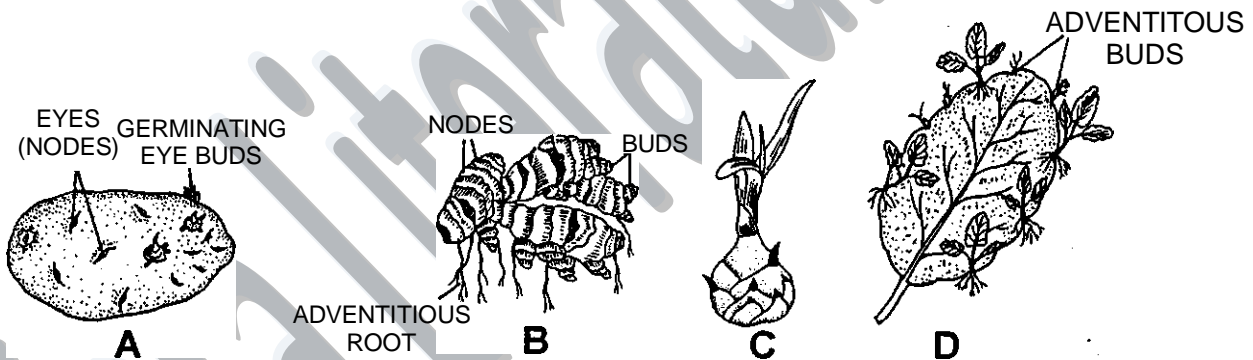
11. In animals and other simple organisms uniparental reproduction is called, called _____ reproduction

- (a) vegetative, asexual (b) Asexual, vegetative
(c) Parthenogenetic, Amphimictic (d) A" phimictic, Apomictic

12. Which of the following is not vegetative propagule?

- (a) Rhizome and sucker (b) Tuber and offset
(c) bulbil (e.g. in Agave), leaf buds, bulb (d) Antherozoid

13. Examine the figures given below and select the right options out of (a - d); in which all the 4 items A, B, C and D are identified correctly -



- | | A | B | C | D |
|-----|----------|----------|----------|-----------|
| (a) | Tuber | Rhizome | Bulb | Leaf buds |
| (b) | Offset | Sucker | Stolon | Leaf buds |
| (c) | Offset | Sucker | Stolon | Leaf buds |
| (d) | Tuber | Rhizome | Bulbil | Leaf buds |

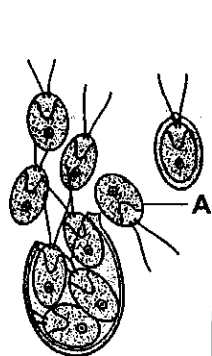
14. Vegetative propagation in mint occurs by-

- (a) offset (b) Rhizome (c) Sucker (d) Runner

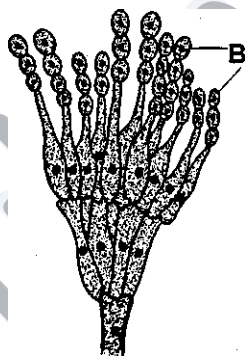
15. In which of the following organism, self fertilisation is seen.

- (a) Fish (b) Roundworm (c) Earth worm (d) River flike

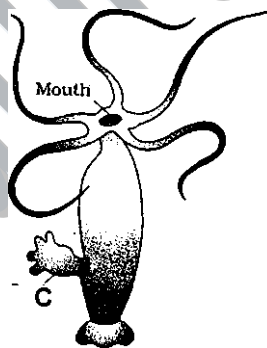
16. A. The plant was introduced in India because of its beautiful flowers and shape of leaves
 B. It can propagate vegetatively at a phenomenal rate and spread all over water body in a short period
 C. It is very difficult to get rid off these plants
 A to C points are related to -
 (a) Dahlia (b) Water hyacinth (c) *Azolla* (water fern) (d) Mosses
17. The fastest method to obtain clones is through -
 (a) induced mutation (b) parasexual hybridization
 (c) parthenogenesis (d) vegetative reproduction-
18. Some organisms are capable of asexual or sexual reproduction. Under favourable conditions, reproduction proceeds asexually. When conditions become more stressful reproduction switches to a sexual mode. Why?
 (a) Sexual reproduction is simple and more rapid allowing larger numbers of offspring to be produced
 (b) Sexual reproduction requires two separate individuals, who can mutually provide nutrient support during stress
 (c) Sexual reproduction produces individuals with new combinations of recombined chromosomes increasing diversity
 (d) Asexual reproduction requires more energy
19. Identify A to D in given diagrams showing asexual reproductive structure



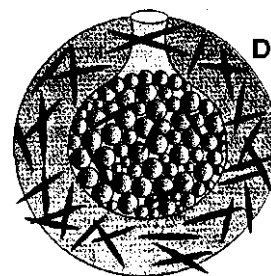
Chlamydomonas



Penicillium



Hydra

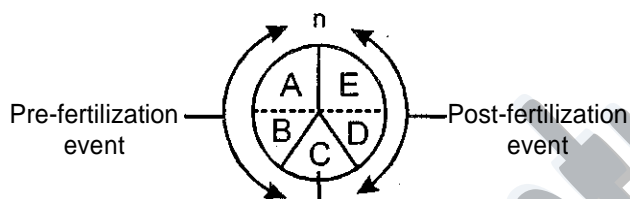


Sponge

- (a) A - Zoogamete, B - Conidia, C - Bud, D - Gemmule
 (b) A - Zoospore, B - Conidia, C - Bud, D - Gemmule
 (c) A - Zoospore, B - Conidiosporangium, C - Bud, D - Gemmule
 (d) A - Aplanospore, B - Conidia, C - Bud, D - Gemmule
20. Among the following which one is not a method of asexual reproduction
 (a) Budding (e.g. yeast) (b) Layering (c) Sowing (d) Binary fission
21. In Monerans (e.g. bacteria) and Protists (*Amoeba*, *Paramecium*, *Euglena*, etc) asexual reproduction occurs by-
 (a) Budding (b) Multi fission (c) Binary fission (d) Amphimixis
22. Clone is the product of-
 (a) Sexual reproduction (b) Sexual or asexual reproduction
 (c) Amphimixis (d) Asexual reproduction

23. Individuals of a clone-
- (a) Are genetically similar but morphologically different (b) Are morphologically similar but genetically different
(c) Are morphologically and genetically similar (d) Are genetically and phenotypically different
24. A scion in grafted on stock. The quality of fruits produced will be determined by the gero type of-
- (a) Stock (b) Scion (c) Both Stock and Scion (d) Neither stock or scion
25. Which of the following sequences of organisms is correct in respect of life spans?
- (a) Banyan tree > Parrot > Elephant > Crocodile > Crow (b) Crow > Crocodile > Elephant > Parrot > Banyan tree
(c) Banyan tree > Elephant > Crocodile > Parrot > Crow (d) Crow > Parrot > Elephant > Crocodile > Banyan tree
26. No individual is immortal except-
- (a) Single celled organisms (b) Green plants (c) Sponges (d) Drones
27. The period from birth to the natural death of an organism represents-
- (a) Reproductive phase (b) Life cycle (c) Life span (d) Life style
28. Which of the following statements is false?
- (a) Asexual reproduction is simpler than sexual reproduction
(b) Asexual reproduction occurs by fission, budding and fragmentation
(c) In most of the animals both asexual and sexual modes of reproduction are found
(d) Vegetative and sexual modes of reproduction are exhibited by the higher plants
29. Which of the following is cultivated through vegetative propagation -
- (a) Potato and Sugarcane (b) Banana and Ginger (c) Dahlia and Rose (d) All
30. Which of the following animal is having longitudinal binary fission.
- (a) Euglena (b) Plasmodium (c) Planaria (d) Paramecium
31. Select the correct sequence from the following.
- I. Juvenile phase → Senescent phase → Reproductive phase
II. Juvenile phase → Reproductive phase → Senescent phase
III. Reproductive phase → Juvenile phase → Senescent phase
IV Vegetative phase → Reproductive phase → Senescent phase
- (a) I and II (b) I and IV (c) III and IV (d) II and IV
32. Select the correct sequence from the following -
- (a) Gametogenesis → Syngamy → Zygote → Embryogenesis
(b) Gametogenesis → Syngamy → Embryogenesis → Zygote
(c) Zygote → Embryogenesis → Gametogenesis
(d) Syngamy → Gametogenesis → Zygote → Embryogenesis
33. Spermatids are transformed into spermatozoa by-
- (a) Spermatiation (b) Supermatogenesis (c) Supermiogenesis (d) Supermatosis

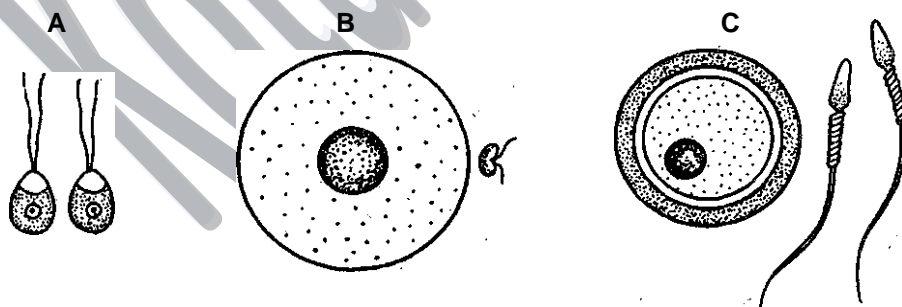
34. Which of the following plants do not show clear cut vegetative, reproductive and senescent phase?
 (a) Perennial plants (b) Annual plants (c) Biennial plants (d) Either b or c
35. Which of the following is correct about *Strobilanthes kunthiana*?
 (a) It flowers once in 12 years.
 (b) The plant came to flower last time in September-October 2006.
 (c) Its mass flowering converted large hilly tracts of Kerala, Karnataka and Tamil Nadu into blue stretches that attracted a large number of tourists
 (d) All
36. Which of the following regulates the reproductive processes and the associated behavioural expressions of organisms?
 (a) Hormones (b) Environmental factors
 (c) Abiotic components (d) Interaction between hormones and environmental factors
- 37.



Identify the events (A, B, D and E) in life of general reproduction -

- (a) A - Gamete transfer, B - Gametogenesis, D - Zygote formation, E - Embryogenesis
 (b) A - Gametogenesis, B - Gamete transfer, D - Zygote formation, E - Embryogenesis
 (c) A - Gametogenesis, B - Zygote formation, D - Gamete transfer, E - Embryogenesis
 (d) A - Gametogenesis, B - Gamete transfer, D - Embryogenesis, E - Zygote formation
38. Which of the following is a hermaphrodite-
 (a) Ant (b) Aphids (c) Earthworms (d) Cockroach

39.



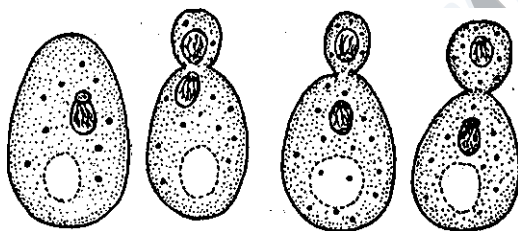
Identify gametes (A, B and C) respectively -

- (a) Heterogametes, isogametes, Homogametes (b) Isogametes, homogametes, heterogametes
 (c) Homogametes, isogametes, heterogametes (d) Homo / Isogametes, heterogametes, heterogametes
40. Which of the following statements is true about water hyacinth?
 (a) It gives useful products to be used in medicine (b) It is a marine plant
 (c) It takes oxygen from water which causes death of fishes (d) It is being cultivated in sea water for biogas

41. In flowering plants both male and female gametes are non-motile. The method to bring them together for fertilization is -
 (a) Water only (b) Air only (c) Pollination (d) Apomixis
42. Meiosis-
 (a) does not take place in organisms showing asexual reproduction only
 (b) takes place in sexually reproducing haploid organism
 (c) takes place in sexually reproducing diploid organism
 (d) all of the above are correct
43. Offsprings of oviparous animals are at greater risk as compared to offsprings of viviparous animals because -
 (a) Proper embryonic care and protection is lesser (b) Embryo is not developed
 (c) Progenies are with more variation (d) Progenies are larger
44. In majority of organisms male gamete is _____ and female gamete is _____.
 (a) Motile, motile (b) Non-motile, non-motile
 (c) Non-motile, motile (d) Motile, stationary (non-motile)
45. Transverse binary fission occurs in-
 (a) Euglena (b) Amoeba (c) Hydra (d) Paramecium
46. Oestrus cycle is seen in -
 (a) Cows and sheep (b) Rats and deers (c) Dogs and tiger (d) All
47. Menstrual cycle is reported in -
 (a) Only humans (b) Only apes
 (c) Only monkey (d) Primates like humans, apes and monkey
48. Animals which give birth to young ones are said to be -
 (a) Viviparous (b) Amphibious (c) Coelomates (d) Oviparous
49. Ploidy of ovary, anther, egg, pollen, male gamete and zygote are respectively -
 (a) $2n$, $2n$, n , $2n$, n , $2n$ (b) $2n$, $2n$, n , n , n , $2n$ (c) $2n$, n , n , n , n , n (d) $2n$, $2n$, n , $2n$, $2n$, $2n$
50. Which of the following is viviparous?
 (a) Reptiles (b) Frog (c) All mammals (d) Majority of mammals
51. In small flies such as *Musca*, reproduction occurs in larval stage, it is called-
 (a) neoteny (b) paedogenesis (c) parthenogenesis (d) parthenocopy
52. Find the correct combination-
 (a) Zoospore in sponge (b) Conidia in Algae
 (c) Gemules in *Paramecium* (d) Buds in hydra
53. The motile reproductive structure of algae and fungi, which directly give rise to new individuals are called-
 (a) Cysts (b) Conidia (c) Buds (d) Zoospores

54. Ciliated motile spores are called-
 (a) Aplanospores (b) Conidia (c) Zoospores (d) Oospores
55. In grafting contact is made between-
 (a) Cambium (b) Flower (c) Xylem (d) Phloem
56. In grafting process, the callus is-
 (a) Formed by proliferation of exposed parenchymatous cells of stock and scion
 (b) The protective padding fixed around the plant
 (c) The tissue produced *in vitro* culture of explant and tied around the joint of stock and scion
 (d) Developed by the activity of the cambium of scion and stock
57. Birds in captivity (as in poultry farms) can be made to lay eggs throughout the year. In this case laying eggs is -
 (a) Related to reproduction and a commercial exploitation for human welfare.
 (b) Neither related to reproduction nor a commercial exploitation for human welfare.
 (c) Not related to reproduction but a commercial exploitation for human welfare.
 (d) Related to reproduction but not a commercial exploitation for human welfare.
58. Which of the following are seasonal breeders?
 (a) frogs (b) Birds (c) Lizards (d) All
59. In which of the following fertilized eggs are covered by hard calcareous shell?
 (a) Frog (b) Reptiles and birds (c) Mammals (d) Frog and Toad
60. Which of the following is a unisexual animal-
 (a) Clamworm (Nereis) (b) Earthworm (Pheretima) (c) Leech (Hirudinaria) (d) All the above
61. In which of the following water is essential for fertilization -
 (a) Algae (b) Bryophytes (c) Pteridophytes (d) All
62. In heterogamous organisms the male gamete and female gametes are called respectively -
 (a) Spermatogonia, oogonia (b) Spermatid, ootid
 (c) Antherozoid (sperm), Egg (ovum) (d) Sperm and oospore
63. In grafting, the newly propagated plant carries the genetic character-
 (a) Scion (b) Stock
 (c) Combination of stock and scion (d) The hybrid of stock and scion
64. Grafting is not possible in monocots as they-
 (a) are herbaceous (b) Lack cambium
 (c) have scattered vascular bundles (d) Have parallel venation
65. In a majority of sexually reproducing organisms, the gametes are -
 (a) Isogametes (b) Homogametes (c) Heterogametes (d) Heterogametes
66. In grafted plant, stock had 48 chromosomes, while scion has 24 chromosomes the chromosome number in root cells and eggs are-
 (a) 48 and 12 (b) 24 and 12 (c) 24 and 24 (d) 48 and 24
67. Life span of may fly is-
 (a) 1 week (b) 1 day (c) 1 month (d) 1 year

68. Life span of crocodile in-
 (a) 60 years (b) 30 years (c) 45 years (d) 15 years
69. "Nothing lives forever yet continues", explains the role-
 (a) Repolⁿ is nature (b) Decomposition in nature
 (c) Adaptation is nature (d) Nutrition is nature
70. Which of the following groups of plants are propagated through undergoend root
 (a) Bupophyllum and kalnctoe (b) Geiger, potato, anion and zamikard
 (c) Pistia, chrysanthemum and pineapple (d) Sweet potato, Asparagines, Tapioca, Dahlia
71. Mater List I with List II and select the covert options.
List-I
 A. Gemmules
 B. Leaf buds
 C. Bulbil
 D. Offset
 E. Conidia
 (a) A-4, B-5, C-1, D-3, E-2
 (c) A-3, B-5, C-4, D-2, E-1
- List-II**
 1. Agave
 2. Pericillium
 3. planter hyacinth
 4. Sponges
 5. Beyoptyllun
 (b) A-4, B-3, C-2, D-1, E-5
 (d) A-4, B-1, C-5, D-3, E-2
- 72.



- (a) It is a type of parthenogenesis
 (b) It is a type of asexual reproduction
 (c) The offsprings can also be called as clone
 (d) Both (a) and (c)

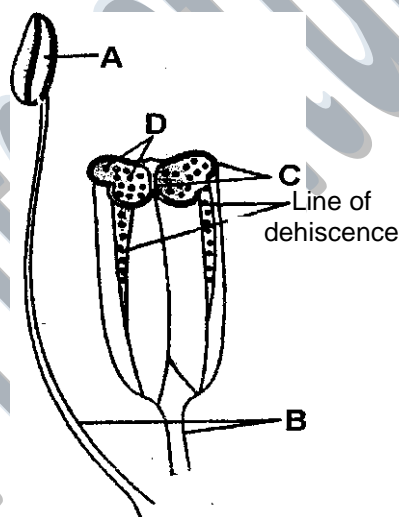
ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	d	a	d	b	c	a	d	b	a	b	b	d	d	c	d	b	d	c	b	c
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	c	d	c	b	a	a	c	c	d	a	d	d	c	a	d	d	b	c	d	c
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	c	d	a	d	d	d	d	a	b	d	b	d	d	c	a	a	c	d	b	a
Ques.	61	62	63	64	65	66	67	68	69	70	71	72								
Ans.	d	c	a	b	d	d	b	a	a	d	a	d								

2

SEXUAL REPRODUCTION IN FLOWERING PLANTS

- Double fertilisation was first discovered by Nawaschin (1898) in-
 (a) Lilium and Frittilaria (b) Mango and sugarcane (c) Papaya and Pea (d) brassica and Condruft
- If testa is removed from the water soaked gram seed, the remaining structure is-
 (a) Full mature embryo (b) Cotyledon with endosperm
 (c) Cotyledon filled with starch (d) None of the above
- Which of the following is false?
 (a) Flowers do not exist only for us to be used for our own selfishness
 (b) All flowering plants show sexual reproduction
 (c) Gymnosperms, being nonflowering, do not show sexual reproduction
 (d) Flowers are objects of aesthetic, ornamental, social, religious and cultural value
-

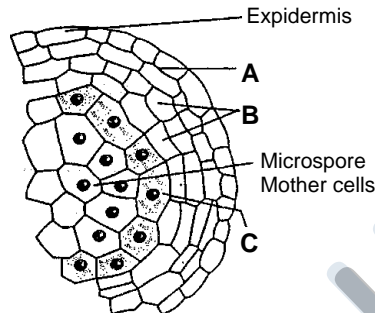


Identify A to D-

A	B	C	D
(a) Anther	Petiole	Pollen sac	Megaspore
(b) Anther	Petiole	Megasporangium	Pollen grains
(c) Anther	Pedicel	Megasporangium	Pollen grains
(d) Anther	Filament	Pollen sac	Pollen grains

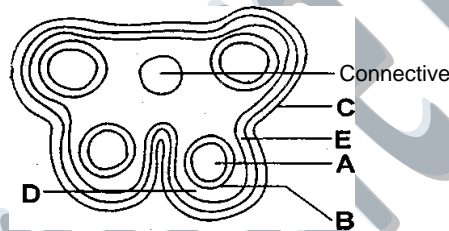
- Microsporangium is generally surrounded by 4 wall layers. Which of the following 3 wall layers perform the function of protection and help in the dehiscence of anther to release the pollen?
 (a) Epidermis, tapetum, endothecium (b) Epidermis, aril, endothecium
 (c) Epidermis, endodermis, mesocarp (d) Epidermis, middle layer and ndothecium
- Each cell of sporogenous tissue in anther is -
 (a) Microspore (b) Pollen
 (c) Potential pollen or microspore mother cell (d) Megaspore mother cell

7.



The above given diagram is an enlarged view of one microsporangium of a matured anther, identify A, B and C -
 (a) A-Middle layer, B-Endothecium, C-Tapetum (b) A-Endothecium, B - Tapetum., C-Middle layer
 (c) A-Endothecium, B - Middle layer, C-Tapetum (d) A-Tapetum, B - Middle layer, C – Endothecium

8.



The above diagram refers to a T. S. of anther. Identify A to E respectively -
 (a) Sporogenous tissue, tapetum, epidermis, middle layer, endothecium
 (b) Sporogenous tissue, epidermis, tapetum, middle layer, endothecium
 (c) Sporogenous tissue, epidermis, middle layer, tapetum, endothecium
 (d) Sporobgenbusiissue, tapetum, middle layer, epidermis, endothecium

9. Which of the following sequences of development of embryo sac / female gametophyte is correct?

- (a) Nucellus —^ Megaspore —> Embryo sac
- (b) Nucellus —*> Megaspore mother cell —> Megaspore —^ embryo sac
- (c) Nucellus —^ Megasporangium —+> Megaspore —*> Embryo sac
- (d) Nucellus —^ Megagametophyte —^ Megaspore —^ Embryo sac

10. Match the Column I with Column II

Column I

- A. Funicle
- B. Hilum
- C. Integument
- D. Chalaza
- E. Nucellus

- (a) A-i, B-II, C-III, D-IV, E-V
- (c) A-IV, B-II, C-I, D-III, E-V

Column II

- I. Mass of cells within ovule with more food
- II. Basal part of ovule
- III. One or 2 protective layers of ovule
- IV Region where body of ovule fuses with funicle
- V. Stalk of ovule

- (b) A-V, B-IV, C-III, D-II, E-I
- (d) A-I, B-III, C-V, D-II, E-IV

11. Which of the following is correct about *Parthenium* (Carrot grass)?

- (a) *Parthenium* came into India as a contaminant with imported wheat
- (b) It has become ubiquitous in occurrence
- (c) It causes pollen allergy
- (d) All of the above

12. In angiosperms pollination occurs when pollen grains are in -

- (a) 2-celled stage
- (b) 3-celled stage
- (c) 2 or 3 celled stage
- (d) Uninucleate stage :

13. Which of the following statements is false?

- I. Pollen grains represents immatured male gametophyte
- II. In angiosperms partially developed male gametophytes are pollinated
- III. Generative cell is sponogenous while vegetative cell is spermatogenous
- IV. Formation and differentiation of pollen grains is called microsporogenesis
- V. Hay fever is a pollen allergy
- VI. Pollen grains of some plants produce severe allergy and respiratory or bronchial diseases
- VII. Pollen grains are poor in nutrients.

(a) I and VII

(b) III and VII

(c) IV and V

(d) VI and VII

14. Which of the following has the least pollen viability?

(a) Cereals like wheat and rice

(c) Members of Leguminosae

(b) Members of Rosaceae

(d) Members of Solanaceae

15. In typical embryo sac, the nuclei are arranged as -

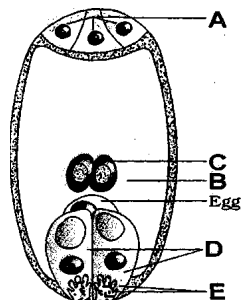
(a) 3 + 2 + 3

(b) 3 + 3 + 2

(c) 2 + 3 + 3

(d) 2 + 4 + 2

16.



Identify A, B, C, D and E structures shown in figure of a female gametophyte-

	A	B	C	D	E
(a)	Antipodal cells	Central cell	Polar nuclei	Synergids	Acrosorhe
(b)	Antipodal cells	Central cell	Polar nuclei	Synergids	Filiform apparatus
(c)	Synergids	Central cell	Polar nuclei	Antipodal cells	Filiform apparatus
(d)	Synergids	Megaspore mother cell	Polar nuclei	Synergids	Filiform apparatus

17. Embryo sac is monosporic when it develops from -

(a) One of the four megaspores of a megaspore mother cell (MMC)

(b) 3 megaspores of a megaspore tetrad

(c) 2 megaspores

(d) The MMC where meiosis has occurred but cytokinesis does not take place

18. For the formation of embryo sac, the megaspore mother cell undergoes -

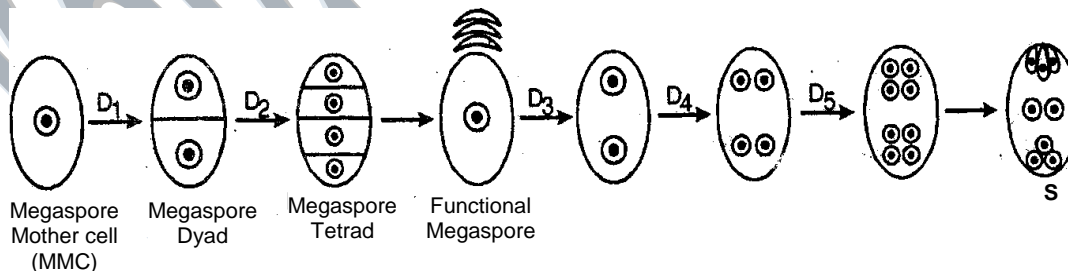
(a) Two meiotic and two mitotic divisions

(b) One meiotic and three mitotic divisions

(c) Two meiotic divisions

(d) One meiotic and two mitotic divisions

19.



The diagram above shows megasporogenesis and development of typical female gametophyte in angiosperms. In which of the following options all divisions (D_1 to D_5) and structure (S) are correctly identified?

	D_1	D_2	D_3	D_4	D_5	S
(a)	Meiosis I	Meiosis II	Mitosis	Mitosis	Mitosis	Microgametophyte
(b)	Meiosis I	Meiosis II	Mitosis	Mitosis	Mitosis	Embryo
(c)	Meiosis I	Meiosis II	Mitosis	Mitosis	Mitosis	Embryo sac
(d)	Mitosis	Meiosis	Mitosis	Mitosis	Mitosis	Embryo sac

20. Match Column I with Column II-

Column I

A. Megasporogenesis

Column II

I. Monosporic development

B. Megagametogenesis

C. Sporopollenin

D. Typical embryo sac

	A	B	C	D
(a)	I	II	III	IV
(b)	IV	III	II	I
(c)	IV	I	II	III
(d)	III	II	I	IV

II. Fatty substance

III. Embryo sac formation

IV. Megaspore formation

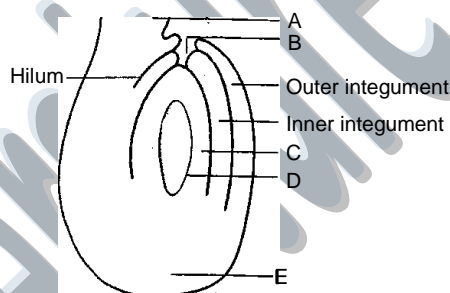
21. An interesting modification of flower shape for insect pollination occurs in some orchids in which a male insect mistakes the pattern on the orchid flower for the female of its species and tries to copulate with it, thereby pollinating the flower, this phenomenon is called-

(a) Pseudoparthenocary (b) Mimicry (c) Pseudopollination (d) Pseudocopulation

22. Pollination by snail and slug is known as-

(a) Ornithophilous (b) Chiropterophilous (c) Entomophilous (d) Malacophilous

23.



A diagrammatic view of a typical anatropous ovule is given above. In which of the following all five parts labelled as A, B, C, D and E are correctly identified -

	A	B	C	D	E
(a)	Funicle	Micropyle	Female gametophyte	Embryo sac	Chalaza
(b)	Raphe	Micropyle	Egg	Embryo sac	Chalaza
(c)	Placenta	Micropyle	Egg	Embryo sac	Chalaza
(d)	Funicle	Micropyle	Nucellus	Embryo sac	Chalaza

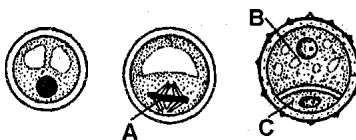
24. Pollen grains can be stored in liquid nitrogen at -

(a) 70°C (b) 100°C (c) -196°C (d) 0°C

25. The viability of pollen grains depends upon -

(a) Prevailing temperature (b) Prevailing humidity
(c) Genetic potentiality of the concerned species (d) Members of Solanaceae

26.



The above diagram shows some stages in microgametogenesis. Identify A, B and C -

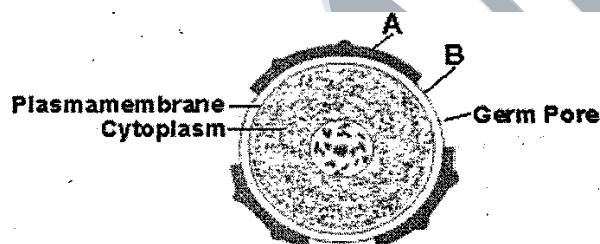
	A	B	C
(a)	Symmetric spindle	Generative cell	Vegetative cell
(b)	Symmetric spindle	Vegetative cell	Generative cell
(c)	Asymmetric spindle	Vegetative cell	Generative cell
(d)	Asymmetric spindle	Generative cell	Vegetative cell

27. Which of the following points is incorrect about sporopollenin?

(a) It is one of the most resistant organic material known
(b) It can withstand high temperature and strong acids and alk
(c) 2 enzymes that degrade sporopollenin are known so far
(d) Pollen grains are well preserved as fossils because of presence of sporopollenin

28. Which of the following sequences is correct for microsporogenesis?
- (a) Micro S.M.C (2N) $\xrightarrow{\text{Mitosis}}$ Microspore tetrad (2N) $\xrightarrow{\text{Meiosis}}$ Microspore (N)
 (b) Micro S.M.C (2N) \longrightarrow Microspore tetrad (N) \longrightarrow Microspores (N)
 (c) Microspore tetrad (2N) $\xrightarrow{\text{OSIS}}$ Microspores
 (d) Micro S.M.C (2N) $\xrightarrow{\text{Mitosis}}$ Microspore tetrad (2N) $\xrightarrow{\text{Meiosis}}$ Microspores (2N)
29. The proximal part of filament of stamen is attached to -
- (a) Thalamus or the petal (b) Sepals or thalamus
 (c) Pedicel or petiole (d) Ovary or ovule
30. Diversity of structures of the inflorescences, flower and floral parts -
- (a) Are responsible for making our garden beautiful
 (b) Ensure self pollination
 (c) Are adaptations to ensure formation of end products of sexual reproduction
 (d) Ensure anemophily

31.



A and B are respectively -

- (a) Exine, intine (b) Intine, exine (c) Epidermis and endodermis (d) Epicarp and endocarp
32. As the anthers mature and dehydrate, the separate and dissociate from each other and develop into
- (a) Megaspore, embryo sac (b) Microspores, pollen grains
 (c) Pollen grains, megaspores (d) Megaspores, microspores

33.

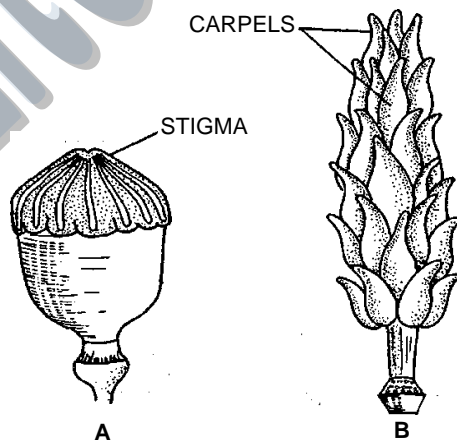
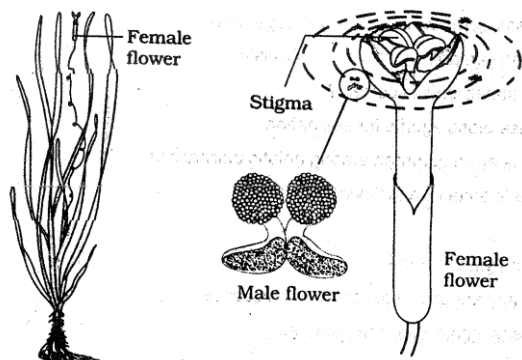


Figure A and B show female reproductive organs of *Papaver* and *Michelia* respectively-

- (a) A- Multicarpellary syncarpous pistil and B - Multicarpellary apocarpous pistil
 (b) A- Multicarpellary apocarpous pistil and B - Multicarpellary syncarpous pistil
 (c) Both A and B are multicarpellary and syncarpous pistils
 (d) Both A and B are multicarpellary apocarpous pistil
34. The female gametophyte /embryo sac of typical dicot (*Polygonum*) or monosporic embryo sac is -
- (a) 7-celled and 7-nucleate (b) 8-celled and 8-nucleate (c) 7-celled and 8-nucleate (d) 8-celled and 7-nucleate
35. Geitonogamy is -
- (a) Functionally cross pollination involving a pollinating agent
 (b) genetically it is similar to autogamy since the pollen grains come from the same plant
 (c) Functionally and genetically autogamy
 (d) Both a and b are correct

36. Which of the following is false about xenogamy?
 (a) It is the transfer of pollen grains from anther to stigma of another plant of the same species
 (b) It produces genetic variation
 (c) it is genetically and ecologically (= functionally) cross pollination
 (d) It occurs in Cleistogamous flowers
37. Autogamy is -
 (a) Transfer of pollen grains from anther to stigma of the same flower
 (b) transfer of pollen grains from anther to stigma of another flower
 (c) Pollination between two flower
 (d) Maturation of anther and stigma at different times
38. A monocarpic plant in are which-
 (a) Has only are carpel
 (b) Flowers and fruits only once in life time and thereafter dies
 (c) Produces only seed
 (d) None of the above
39. Maturation of male and female sex organo at different times in known as-
 (a) Herkogamy (b) Dichgamy (c) Polygamy (d) Apogamy
40. Embryo sac in also know as-
 (a) Microgametophyte (b) Megagametophyte (c) Microsporangium (d) Megasporangium
41. The term pollination signifies -
 (a) Dehiscence of anther
 (b) The transfer of pollen grains from anther to stigma
 (c) The transfer of pollen grains from anther to the stigma of the same flower
 (d) Formation of pollinia
42. During the formation of embryo sac from megaspore mitotic divisions occurs. These mitotic divisions are -
 (a) Strictly free nuclear (b) Strictly cellular (c) Strictly reduction (d) Strictly cytoplasmic
43. Which of the following devices is not used by plants to prevent autogamy -
 (a) Self-incompatibility (b) Production of unisexual flowers
 (c) Heterostyly (d) Production of Cleistogamous flowers
44. Go through the following statements -
 I. Flowers are bisexual and homogamous maturing anther and stigma of a flower at the same time.
 II. Mechanical devices bringing anthers and stigma close together in a bisexual chasmogamous flower.
 III. Cleistogamy (bisexual flowers remain closed)
 IV. Anther and stigma of an intersexual flower mature, in bud condition. The above contrivances favour -
 (a) allogamy (b) Autogamy (c) Xenogamy (d) Cross pollination
45. Pollination occurring in closed flowers is -
 (a) Bud pollination (b) Cleistogamy (c) Chasmogamy (d) Allogamy
46. Cleistogamous flowers produces assured seed-set even in the absence of pollinator - why?
 (a) Because they have fragrance (b) Because they remain open
 (c) Because they are autogamous (d) Because they are colourful
47. Egg apparatus of an embryo sac consists of -
 (a) Egg cell only (b) Egg cell + 3 antipodal cells
 (c) One oosphere (egg) + 2 synergids (d) One oosphere (egg) + 2 synergids + 2 antipodal cells
48. Go through the following points.
 I. Dicliny (unisexuality of flower)
 II. Dichogamy (protoandry or protogyny)
 III. Self sterility / self incompatibility
 IV. Heterostyly
 V. Herkogamy (Barrier between anther and stigma of a bisexual homogamous flower)
 (a) Geitonogamy (b) Xenogamy (c) Allogamy (d) Autogamy

49. Subterranean Cleistogamous and geophilous flowers occur in-
 (a) *Viola* (b) *Commelina* (c) *Ficus bengalensis* (d) *Anthocephalus*
50. The root cell of wheat plant has 42 chromosomes what would be the number of chromosomes in the synergid cell-
 (a) 7 (b) 14 (c) 21 (d) 28
51. 8 nucleated embryo sacs are-
 (a) monopole only (b) Bipole only (c) Tetrasporic only (d) Any of these
52. Contrivance for self-pollination/autogamy is -
 (a) Homogamy (b) bisexual (c) Cleistogamy (d) All
53. The ploidy levels of the cells of the nucellus, MMC, the functional megaspore and female gametophyte -
 (a) 2N, N, 2N, N (b) N, N, 2N, N (c) 2N, 2N, N, N (d) N, 2N, 2N, N
54. Chasmogamy is pollination in -
 (a) Bud condition (b) Closed flowers (c) Unrelated flowers (d) Opened flowers
55. Which of the following plants produce(s) chasmogamous and Cleistogamous flowers?
 (a) *Viola* (Common pansy) (b) *Oxalis* (c) *Commelina* (d) All
56. The largest cell in an embryo sac is -
 (a) Egg (b) Central cell (c) Synergid (d) Antipodal cell
57. The process whereby a perfect flower is pollinated by its pollen is called -
 (a) Allogamy (b) Autogamy (c) Xenogamy (d) Hydrogamy
58. Transfer of pollen grains from anther to the stigma of another flower of same plant is -
 (a) Geitonogamy (b) Xenogamy (c) Autogamy (d) Cleistogamy
59. The development of fruit without fertilisation is-
 (a) Parthenogenesis (b) Parthenocarp (c) Apomixis (d) Apogamy
60. Which type of association is found in between entomophilous flower and pollinating insect-
 (a) Mutualism (b) Commercialism (c) Cooperation (d) None of these
61. In nature, allogamy is met within _____ surely-
 (a) unisexual flowers (b) Neuter flowers (c) Underground flowers (d) Bisexual flower
62. In Tapegrass (*Vallisneria*) -
 (a) The female flower reach the surface of water by long stalk and male flowers / pollen grains are released on to the surface
 (b) Monoecism is found
 (c) Pollen grains or flowers are actively carried by water current
 (d) All the above are correct
63. I. Flowers are small. They are often packed in inflorescence
 II. Flowers are colourless, nectarless and odourless
 III. Well exposed stamens
 IV. Pollen grains - produced in large number, light, non-sticky
 V. Flowers often have a single ovule in each ovary
 VI. Stigma - large, often feathery.
 The above contrivances favour-
 (a) Self pollination (b) Anemophily (pollination by wind)
 (c) Ornithophily (pollination by birds) (d) Entomophily (pollination by insects)
64. Anthesis is a phenomena which refers to-
 (a) Formation of pollen (b) Development of anther (c) Opening of flower bud (d) Reception of pollen
65. Plants of which of these groups are pollinated by the same agency-
 (a) *Triticum*, *cocos*, *mangifera* (b) *Ficus*, *Kigelia*, *Casurina*
 (c) *Salvia*, *Morus*, *Euphorbia* (d) *Bombax*, *Butea*, *Bactria*.
- 66.



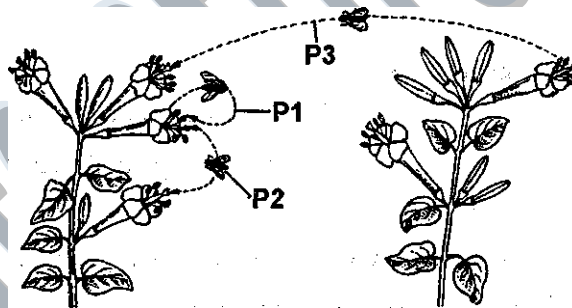
The above figure showing hydrophyly is of

- (a) *Zostera* (b) *Lotus* (c) *Vallisneria* (d) *Hydrilla*

67. Which of the following statements is correct.

- (a) Majority of plants use biotic agents for pollination
(b) Pollination by wind is more common among abiotic pollinations
(c) Pollination by water is quite rare in flowering plants
(d) All

68.



The above diagram shows 2 plants of the same species. Identify the types of pollination indicated as P1, P2 and P3.

- | | P1 | P2 | P3 |
|-----|-------------|-------------|-------------|
| (a) | Allogamy | Chasmogamy | Cleistogamy |
| (b) | Autogamy | Xenogamy | Geitonogamy |
| (c) | Autogamy | Geitonogamy | Xenogamy |
| (d) | Geitonogamy | Allogamy | Autogamy |

69. Which of the following statements is false?

- I. *Vallisneria* and *Hydrilla* are fresh water plants while sea-grasses (e.g. *Zostera*) are marine plant.
II. *Vallisneria* is epihydrophilous while *Zostera* is hypohydrophilous
III. Pollination in water lily / *Nymphaea* and *Eichhornia* (water hyacinth) takes place by insects ~ v
IV. In majority of aquatic plants flowers emerge above the level of water and are pollinated by insects or wind
V. In most of the water pollinated species, pollen grains are protected from wetting due to absence of mucilaginous covering
VI. In hydrophilous plants pollen grains are spherical

- (a) All (b) None (c) VI (d) IV

70. Which of the following is false?

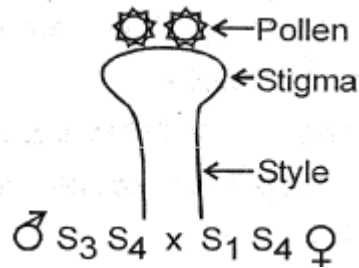
- (a) Wind-pollination is quite common in grasses
(b) Hydrophyly is limited to about 30 genera mostly monocots
(c) Both wind and water pollinated flowers are not very colourful and do not produce nectar
(d) None of the above

71. Self-incompatibility -

- (a) works the same-way in all plants
(b) Does not have potential agricultural applications
(c) Maintains variation

- (d) On the same mechanism of transplant rejection seen in animal
72. All of the following include outbreeding devices except -
 (a) Unisexuality of flowers, self-incompatibility
 (b) Pollen release and stigma receptivity are not synchronized
 (c) Anthers and stigma are placed at different position
 (d) Bisexuality, homogamy, cleistogamy
73. I. Flowers are usually large, colourful, fragrant
 II. Pollen grains are produced in large number
 III. Pollen grains are light in weight and non-sticky
 IV. Sticky pollen grains
 V. Stigma rough and sticky
 VI. Stigma is feathery
 Which of the above characters favour entomophily?
 (a) II, IV, V (b) I, II, III (c) III, IV, V (d) I, IV, V
74. Which of the following would not have an effect on flowering of a particular plant species?
 (a) Plant age (b) Nutritional status (c) Temperature (d) Prevailing wind
75. Choose the mismatched options-
 (a) Wind-cannabin : Anemophily (b) Water-Zoostera : Hydrophily
 (c) Insects-Salvia : Entomophily (d) Birds-Adonsoria : Ormithophily
76. Self-incompatibility -
 I. Is a device to prevent inbreeding.
 II. Provides a biochemical block to self-fertilization.
 III. Ensures cross-fertilization.
 IV. Is governed by pollen-pistil interaction
 V. Is governed by series of multiple alleles.
 VI. Prevents self pollen (from the same flower or other flowers of the same plant) from fertilizing the ovules by inhibiting pollen germination or pollen tube growth in the pistil.
77. Majority of flowering plants- I
 (a) Produce hermaphrodite flowers (b) Are dioecious
 (c) Show self-pollination (d) Show autogamy
78. Which of the following is the tallest flower?
 (a) *Vallisneria* (b) *Lotus* (c) *Amorphophallus* (d) *Zostera*
79. Which of the following Paris has Laploid number of chromosomes-
 (a) Nucleellus and Antipodal cells (b) Egg nucleus and secondary nucleus
 (c) Megaspore mother cell Egg nucleus (d) Egg cell and antipodal cells
80. A plant that is self-incompatible has a genotype of S_5S_q for S-locus. It receives pollen from a plant that is S_3S_q . Which of the following is most likely to occur?
 (a) All of the pollen will germinate, forming pollen tubes (b) None of the pollen will germinate
 (c) About half of the pollen will germinate (d) Fertilization will occur in about pollinated plant

81.



The above diagram refers the self-incompatibility. The genotypes of embryo and endosperms are –

	Embryo	Endosperm
(a)	$S_1 S_3, S_3 S_4$	$S_3 S_4 S_4$
(b)	$S_4 S_4$	$S_3, S_3 S_4, S_1, S_1 S_3$
(C)	$S_1 S_3, S_3 S_4$	$S_1, S_1 S_3, S_4, S_4 S_3$
(d)	S_1, S_1	$S_1, S_3 S_4$

82. Unisexuality of flower prevents -

- (a) Geitonogamy but not xenogamy (b) Autogamy but not geitonogamy
(c) Autogamy and geitonogamy (d) Both geitonogamy and xenogamy

83. Which of the following are usual floral rewards to pollinating animals?

- (a) Shelter and pollen grains (b) Shelter and fragrance
(c) nectar and pollen grains (d) Nectar and fragrance

84. Moth (*Pronuba / Tegaticula*) passes its larval stage in plant pollinated by it. The plant is

- (a) *Ficus* (b) *Tagetes* (c) *Cosmos* (d) *Yucca*

85. The most common type of pollination is -

- (a) Entomophily (b) Ornithophily (c) Malacophily (by snails) (d) Chiropterophily (by bats)

86. Long silky hair coming out of the cob of maize are-

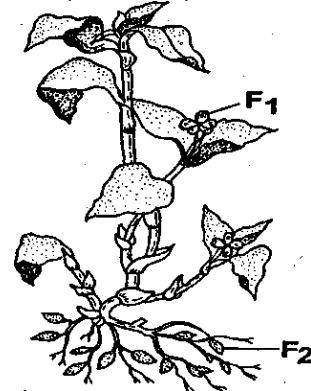
- (a) Meant for fruit dispersal (b) Meant for attracting insects
(c) Meant for protecting seeds (d) Long styles and stigma

87. Find out the correct option -

- (a) Among animals, insects, particularly bees are the dominant biotic pollinating agents
(b) Often flowers of animal - pollinated plants are specially adapted for particular species of animals
(c) In some species floral rewards like edible nectar, pollen grains, shelter for egg laying are given to pollinating animals
(d) All

88. The given figure shows the plant of *Commelina* with two types of flowers (F_1 and F_2). The flowers are –

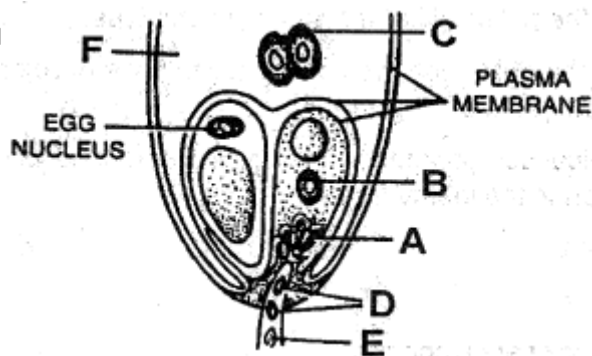
	F_1	F_2
(a)	Neutral	Staminate
(b)	Cleistogamous	Chasmogamous
(c)	Chasmogamous	Cleistogamous
(d)	Cryptogamous	Ovulate



89. In which part of a flower do both meiosis and fertilization occur?

- (a) ovule (b) stigma (c) anther (d) petal

90. What is the genetic importance of outcrossing?
 (a) Outcrossing is a characteristic of pollinators
 (b) Outcrossing increases genetic diversity in a population
 (c) Outcrossing increases the chances of sterility
 (d) Outcrossing promotes inbreeding in a population
91. Repeated self pollination over the generation produces –
 (a) New varieties (b) Better progenies (c) Inbreeding depression (d) Elimination of weak traits
92. Which of the following plants provide floral rewards to their pollinating agents -
 (a) *Zostera and Vallisneria* (b) *Hydrilla and Commelina*
 (c) *Amorphophallus and Yucca* (d) Sugarcane and Pigeonpea
93. An obligate association between flower and pollinating agent is found in -
 (a) *Yucca* (b) Maize (c) *Cosmos* (d) *Arena*
94. seedling banana is -
 (a) Parthenocarpic fruit (b) Multiple fruit (c) Seven called (d) Eight celled
95. Double fertilisation involves,
 (a) Fertilisation of the egg by two male gametes
 (b) Fertilisation of two egg in the same embryo sac by two sperms brought by one pollen tube
 (c) Fertilisation of the egg and the central cell by two sperms brought by different pollen tubes
 (d) fertilisation of the egg and central cell by two sperms brought by the same pollen
96. Select the correct order of endosperm types.
 (a) Cellular, helobial, free nuclear (b) Cellular, free nuclear, helobial
 (c) Helobial, free nuclear, cellular (d) Free nuclear, cellular, helobial
97. In castor and maize autogamy is prevented but geitonogamy occurs because -
 (a) Plants are dioecious (b) Plants are unisexual (c) Flowers are bisexual (d) Flowers are unisexual
- 98.

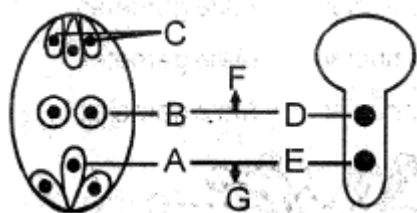


Study the diagram given above showing entry of pollen tube into embryo sac. Identify A to E –

A	B	C	D	E	F
(a) Filiform apparatus	Synergid	Polar nuclei	Vegetative Nucleus	Male gametes	Central cell
(b) Filiform apparatus	Synergid	Polar nuclei	Male gametes	Vegetative Nucleus	Central cell
(c) Obturator	Synergid	Polar nuclei	Male gametes	Vegetative Nucleus	Central cell
(d) Egg apparatus	Synergid	Polar nuclei	Male gametes	Vegetative Nucleus	Central cell

99. Endosperm of the seed develops from -
 (a) Haploid nucleus (b) Triploid nucleus (c) gymnosperms (d) Angiosperms

100.



The above diagram is related to double fertilization. A, B, D, E, F and G are identified as -

- (a) Egg, Polar nuclei, Male gamete, Male gamete, Primary endosperm nucleus (PEN), and Zygote respectively
- (b) Egg, Male gamete, Polar nuclei, Male gamete, Primary endosperm nucleus (PEN), and Zygote respectively
- (c) Egg, Male gamete, Male gamete, Polar nuclei, Primary endosperm nucleus (PEN), and Zygote respectively
- (d) Egg, Polar nuclei, Male gamete, Male gamete, Zygote, and Primary endosperm nucleus (PEN) respectively

101. Which of the following options is correct?

- (a) Pollination gives the guarantee of the promotion of post-pollination events that lead to fertilization
- (b) The events— "from pollen deposition on stigma until pollen tubes enter the ovule" are together referred to as pollen-pistil interaction,
- (c) Pollen-pistil interaction is a dynamic process involving pollen recognition followed by only promotion (not rejection) of the pollen.
- (d) Pistil has no ability to recognise the pollen, whether right or wrong type.

102. Total number of nuclei involved in double fertilization is –

- (a) 2
- (b) 3
- (c) 4
- (d) 5

103. Double fertilization is unique be-

- (a) Pteridophytes
- (b) Bryophytes
- (c) Gymnosperms
- (d) Angiosperm

104. Entry of the pollen tube through the micropyle is-

- (a) Anisogamy
- (b) misogamy
- (c) porogamy
- (d) chalazogamy

105. Emasculation is not required when flowers are -

- (a) Bisexual
- (b) Intersexual
- (c) Unisexual
- (d) Either a or b

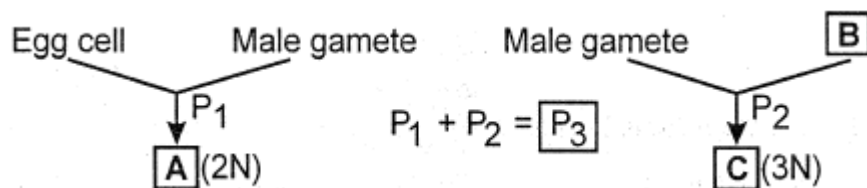
106. A homogamous tall pistillate plant (TT) is crossed with homogamous dwarf staminate plant (tt). What is the genotype of endosperm?

- (a) TTT
- (b) TTt
- (c) Ttt
- (d) ttt

107. Pollen tube enters the embryo sac usually –

- (a) By penetrating egg cell
- (b) Through one degenerated synergid
- (c) By destroying antipodal cells
- (d) Between persistent synergid and central cell

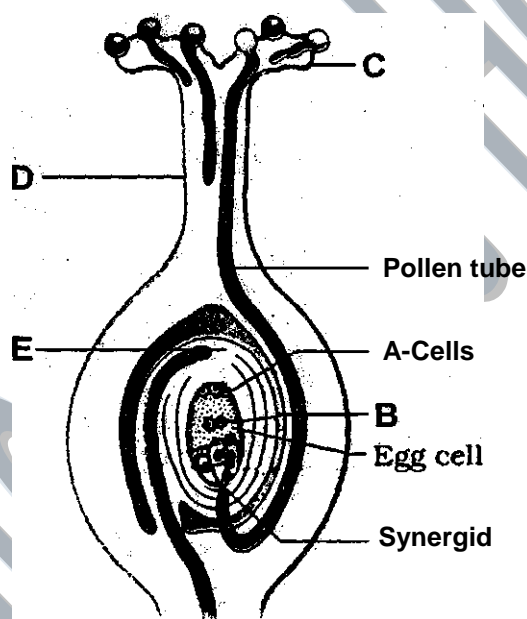
108.



Identify structures A, B, C and phenomena - P₁, P₂, P₃.

	A	B	C	P ₁	P ₂	P ₃
(a)	Zygote	Polar nuclei	PEN	Syngamy	Triple fusion	Double fertilization
(b)	Zygote	Polar nuclei	PEN	Triple fusion	Syngamy	Double fertilization
(c)	Zygote	Synergid	PEN	Syngamy	Triple fusion	Double fertilization
(d)	Zygote	Polar nuclei	PEN	Syngamy	Apogamy	Double fertilization

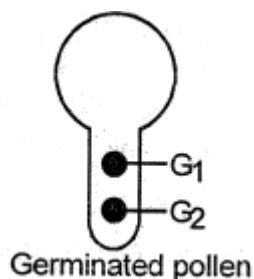
109.



Identify A, B, C, D and E

	A	B	C	D	E
(a)	Antipodal cells	Secondary nuclei	Stigma	Style	Chalaza
(b)	Antipodal cells	Secondary nuclei	Style	Stigma	Chalaza
(c)	Antipodal cells	Secondary nuclei	Stigma	Chalaza	Style
(d)	Antipodal cells	Secondary nuclei	Chalaza	Stigma	Style

110.



Why G₁ and G₂ are genetically identical?

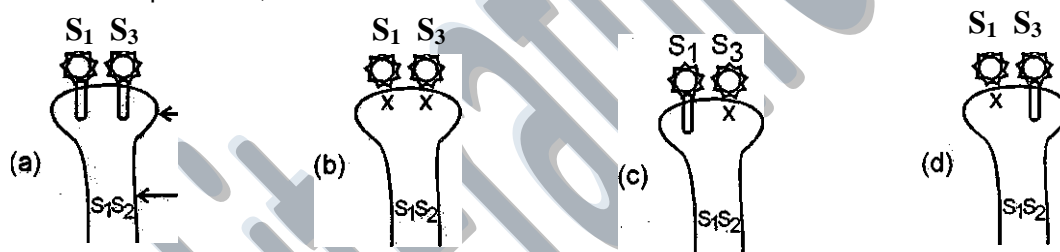
- (a) Because they are products of meiosis
 (b) Because they are products of mitosis
 (c) Because they are products of meiosis
 (d) Because the/are products of amitosis

111. The ability of the pistil to recognise the pollen followed by its acceptance or rejection is the result of a continuous dialogue between pollen grain and the pistil,
 This dialogue is mediated by chemical component[^], of the pollen interacting with those of the pistil. Which of the

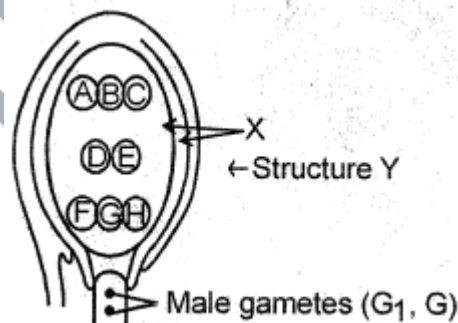
following chemicals mainly takes part in the interaction -

- (a) Nucleotides (b) Proteins (c) Minerals (d) Lipid or inulin

112. The role of double fertilization in angiosperms is to produce-
 (a) Cotyledon (b) Endocarp (c) Endosperm (d) Hormones
113. Which of the following is correct?
 (a) Double fertilization - characteristic of angiosperms
 (b) Double fertilization or triple fusion was discovered by Nawaschin
 (c) Pollen tube shows tip growth and chemotropic movement
 (d) All
114. Coffee plant has chromosome no. of '2n' in its somatic cells, what is the chromosome number in the edible part of coffee seed.
 (a) n (b) 2n (c) 3n (d) 4n
115. Through which cell of the embryo sac does the pollen tube enter the embryo sac-
 (a) Egg cell (b) Central cell (c) Persistent synergist (d) Degenerated synergist
116. Considering the genetic basis of self-incompatibility which of the following options is correct. Male plant is S₁S₂ and female plant is S₁S₃.



117.



The given diagram shows a section through the ovary and pollen tube of a flowering plant just before fertilization. After the fertilization the structures that convert into pericarp and seed coat are respectively -
 (a) X, Y (b) Y, X (c) D, E (d) G, B

118. After triple fusion central cell changes into -
 (a) Embryo (b) Embryo sac
 (c) Primary endosperm cell (PEC) (d) Primary endosperm nucleus
119. Fertilization is depicted by the condition -
 (a) $N \rightarrow 2N$ (b) $2N \rightarrow N$ (c) $2N \rightarrow 4N$ (d) $4N \rightarrow 2N$
120. In double fertilization total number of male nuclei and total number of female nuclei involved are- (a) 3, 2 respectively (b) 2, 3 respectively (c) 2, 2 respectively (d) 3, 3 respectively
121. The cells of endosperm have 24 chromosomes. What will be number of chromosomes in the gametes -
 (a) 8 (b) 16 (c) 72 (d) 24
122. The number of chromosomes in radicle is 16. What will be the number of chromosomes in tube nucleus, antipodal

cells, definitive nucleus and endosperm respectively?

(a) 8, 8, 16, 24

(b) 8, 8, 16, 16

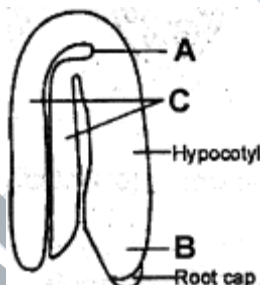
(c) 16, 16, 32, 48

(d) 8, 8, 16, 48

123. Which one of the following produces both enzymes and Lemans-
 (a) Topetum (b) Endothecium (c) Middle layers (d) Epidermis

124. Which of the following is false about emasculation?
 (a) During emasculation process, stigma is removed.
 (b) Emasculated flowers are bagged in order to prevent self-pollination
 (c) Emasculation is the removal of stamens before maturation of selected bisexual flowers
 (d) It is one of the steps for artificial hybridization

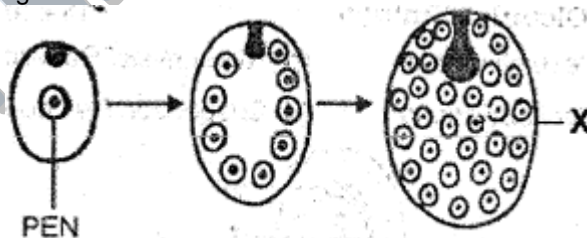
125.



Go through the given diagram of a typical dicot embryo. In which of the following all the 3 parts labelled as A, B, C with their respective functions are correctly identified?

A	B	C
(a) Plumule, shoot system formation	Radicle, root system formation	Hypophysis, formation of radicle
(b) Plumule, shoot system formation	Radicle, root system formation	Cotyledon, food storage
(c) Radicle, root system formation	Plumule, shoot system formation	Cotyledon, food storage
(d) Radicle, root system formation	Plumule, shoot system formation	Endosperm, food storage

126. Go through the following diagram.



X is

- (a) Cellular endosperm
 (c) Helobial endosperm

- (b) Nuclear endosperm
 (d) Ruminant endosperm

127. Albuminous / endospermic seeds are –

- (a) Coconut, castor, sunflower
 (c) Groundnut, pea

- (b) Bean, pea
 (d) None

128. In coconut liquid nuclear endosperm is surrounded by white kernel which is -

- (a) Integument/seed coat (b) Cellular endosperm (c) helobtel'endosperm (d) fibrous mesocarp

129. Which of the following is false?

- I. Endosperm formation starts prior to first division of zygote
 II. Angiospermic endosperm is mostly 3N while gymnc-spermic one is N.

III. The most common type of endosperm is nuclear.

IV Coconut has both liquid nuclear (multinucleate) and cellular endosperm.

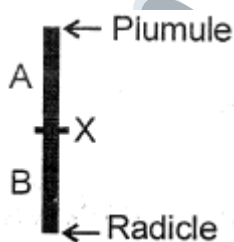
V. Milky water of green tender coconut is liquid female gametophyte.

- (a) I and II only (b) III only (c) V only (d) II only

130. The study of formation, growth and development of new individual from an egg is called -
(a) Embryology (b) Embryogenesis (c) Morphogenesis (d) Embryolysis

131. Endosperm is completely consumed by developing embryo before seed maturation or exalbuminous / non-endospermic seeds are found in -
(a) Pea, ground nut, beans (b) Coconut, castor (c) Maize, wheat (d) Coconut, Wheat

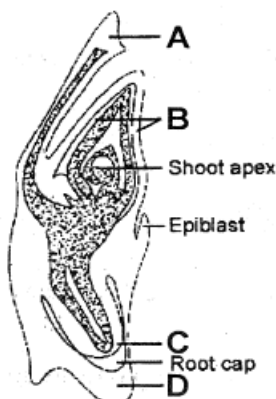
132.



Conder rod like structure as embryonal axis. X is the region at which cotyledon is attached, identify regions A and B respectively.

- (a) Epicotyl, Hypocotyl (b) Hypocotyl, Epicotyl (c) Epicotyl, Mesocotyl (d) Mesocotyl, Hypocotyl

133.



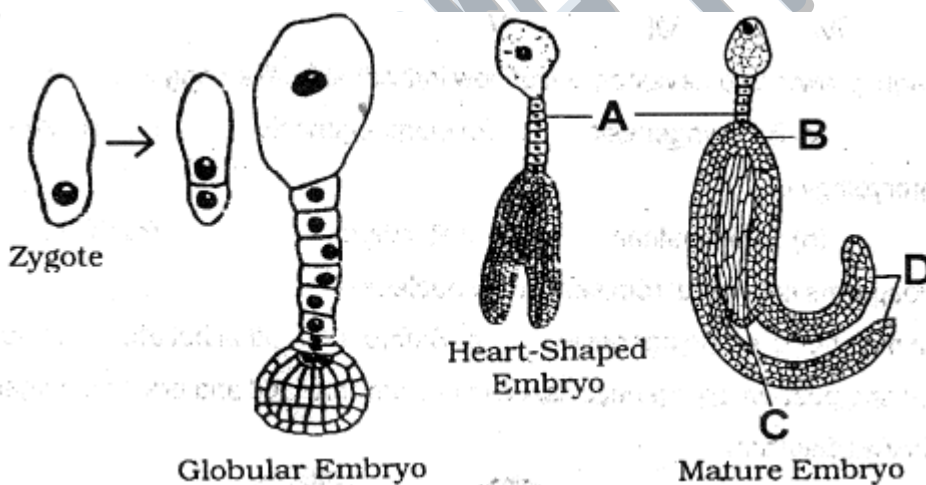
In which one of the options all the four parts A, B, C and D are correct?

- | | A | B | C | D |
|-----|------------|------------|---------|------------|
| (a) | Scutellum | Coleoptile | Radicle | Coleorhiza |
| (b) | Scutellum | Coleorhiza | Radicle | Coleoptile |
| (c) | Hypophysis | Coleorhiza | Radicle | Coleoptile |
| (d) | Hypophysis | Coleoptile | Radicle | Coleorhiza |

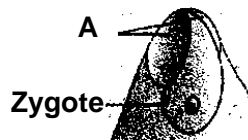
134. During germination, micropyle of seed takes part in -
(a) Forming weak point for emergence of radicle (b) Entry of water and oxygen
(c) passage of gases (d) Leaching inhibitors
135. Which plant part has two generations, one within the other is -
(a) Embryo (b) Germinated pollen grain
(c) Unfertilized ovule (d) Seed

136. Aleurone layer takes part in -
 (a) Protection of delicate embryo (b) Enzyme synthesis
 (c) Transfer of food to cotyledons (d) Is also called scutellum
137. Which of the following statements is correct?
 (a) parthenocarpic fruits (seedless fruits) develop without fertilization e.g, banana.
 (b) Parthenocarpy can be induced by hormones
 (c) Seed is the basis of our agriculture
 (d) All
138. Germination of pollen grains on the stigma is-
 (a) Autogamy (b) in vitro germination (c) in vitro germination (d) in situ germination
139. Match the Column I with Column II -
- | | Column I | Column II | | | |
|-----|------------------|--------------------------|-----|----|-----|
| | A. Ovary | I. Groundnut, mustard | | | |
| | B. Ovule | II. Guava, orange, mango | | | |
| | C. Wall of ovary | III. Pericarp | | | |
| | D. Fleshy fruit | IV. Seed | | | |
| | E. Dry fruits | V. Fruit | | | |
| | A | B | C | D | E |
| (a) | V | IV | III | II | I |
| (b) | I | II | III | IV | V |
| (c) | I | III | II | IV | V |
| (d) | V | IV | I | II | III |
140. In citrus, a seed has 10 embryos. Out of 10 embryos -
 (a) One is normal and 9 are adventive, mostly nucellar embryos
 (b) One is adventive, mostly nucellar and 9 are normal embryos
 (c) 5 are nucellar and 5 are normal embryos
 (d) One is normal and 9 are monozygotic embryos
141. Perisperm differs from endosperm in-
 (a) Having no reserve food
 (b) Being a diploid tissue
 (c) Its formation by fusion of secondary nucleus with several sperms
 (d) Being a haploid tissue
142. Which one of the following statements is correct ?
 (a) Hard outer layer of pollen is called intine (b) Sporogoneous tissue is haploid
 (c) Endothecium produces the microspores (d) Tapetum nourishes the developing pollen
143. What would be number of chromosomes of aleurone cells of plant with 42 chromosome in its root tip cells?
 (a) 42 (b) 63 (c) 84 (d) 2n
144. What is common between vegetative reproduction and Apomixis?
 (a) Both occur round the year (b) Both produces progeny identical to the parent
 (c) Both are applicable to only dicot plants (d) Both bypass the flowering phase
145. Active research is going on in many laboratories around the world to understand the genetics of apomixis. What is the purpose of such active research?
 (a) Hybrid plants are directly formed by apomixis
 (b) Apomixis is the method to produce seed without fertilization
 (c) To transfer apomictic genes into hybrid varieties which will prevent loss of hybrid vigour with successive years
 (d) Apomixis produces genetically different individuals
146. In most plants; the fruit develops from the ovary, other parts degenerate and fall off such fruits are called-
 (a) False fruits (b) True fruits (c) parthenocarpic fruit (d) None of the above

147. An example of a seed with endosperm, perisperm and caruncle is -
 (a) Castor (b) Coffee (c) Lily (d) Cotton
148. In some seeds like black pepper and beet, remnants of nucellus are present. This residual, persistent nucellus is called-
 (a) Aleuron layer (b) Endothelium (c) Perisperm (d) Obturator
149. Embryos of monocotyledons possess only one ____A____. In the grass family the cotyledon is called ____B____ that is situated towards one side (lateral) of the embryonal axis. At its lower end, the embryonal axis has the radical and root cap enclosed in an undifferentiated sheath called ____C____. The portion of the embryonal axis above the level of attachment of scutellum is the ____D____ which has a shoot apex enclosed in a foliar structure called ____E____.
 (a) A - cotyledon, B - scutellum, C - coleorrhiza, D - epicotyl, E - coleoptile
 (b) A - scutellum, B - cotyledon, C - coleorrhiza, D - epicotyl, E - coleoptile
 (c) A - cotyledon, B - scutellum, C - coleorrhiza, D - Hypocotyl, E - coleoptile
 (d) A - cotyledon, B - scutellum, C - coleoptile, D - epicotyl, E - coleorrhiza
150. Diagram given below shows stages in embryogenesis in a typical dicot (*Capsella*). Identify structures A to D respectively-



- (a) Suspensor, Radicle, Plumule, Cotyledons
 (b) Hypophysis, Radicle, Plumule, Cotyledons
 (c) Suspensor, Plumule, Radicle, Cotyledons
 (d) Suspensor, Radicle, Plumule, Hypocotyls
151. Endosperm in angiosperms is formed from secondary nucleus -
 (a) After fertilization but prior to embryogenesis (b) Before fertilization but after embryogenesis
 (c) As post-fertilized and post-embryogenetic tissue (d) As pre-fertilized and pre-embryogenetic tissue
152. In a fertilized ovule, n , $2n$ and $3n$ conditions occur respectively in -
 (a) antipodals, egg, endosperm (b) megaspore mother cell, nucellus, endosperm
 (c) egg, nucellus, microspore (d) endosperm, micropyle, egg
153. Father of Indian embryology is—
 (a) P. Maheshwari (b) Swaminathan (c) R. Misra (d) Butler
154. For artificial hybridisation experiment in bisexual flower, which of the sequences is correct?
 (a) Bagging → Emasculation → Cross pollination → Rebagging
 (b) Emasculation → Bagging → Cross pollination → Rebagging
 (c) Cross pollination → Bagging → Emasculation → Rebagging
 (d) Self-pollination → Bagging → Emasculation → Rebagging
155. The purpose of bagging an emasculated flower in artificial hybridisation programme is
 (a) To prevent intrafloral pollination
 (b) To prevent self-pollination (from the pollen of the same flower)
 (c) To prevent contamination of its stigma with unwanted pollen
 (d) For rebagging
156. Identify the components labelled A, B, C and D in the diagram above from the list I to VIII given along with



components-

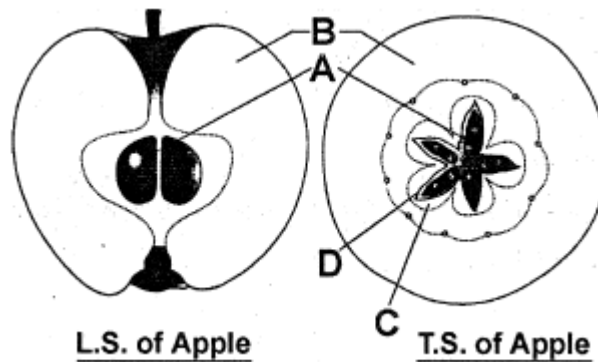
- I. Micropyle
- II. Chalaza
- III. Central cell IV PEN
- V. PEC
- VI. Megaspore
- VII. Degenerating synergid
- VIII. Degenerating antipodal cell
- I.. Polar nuclei

The correct components are-

	A	B	C	D
(a)	I	II	VIII	III
(b)	II	VIII	III	I
(c)	IV	IV	VII	III
(d)	VI	IV	VII	V

157. Maize grain in a-
(a) seed (b) Ovule (c) embryo (d) fruit
158. Which are the external conditions required for seed germination-
(a) Oxygen, carbon dioxide and suitable temperature
(b) Oxygen, light and suitable temperature
(c) Light, moisture and suitable temperature
(d) Oxygen, moisture and suitable temperature
159. Which of the following is false?
(a) The storage tissue of rice and other cereal grains, is endosperm
(b) Outermost layer of endosperm of maize grain is Aleurone layer
(c) Aleurone layer of maize grain is specially rich in proteins
(d) The transformation of ovules into seeds and ovary into fruit does not proceed simultaneously
160. The world's oldest viable seed, excavated from Arctic Tundra is of -
(a) *Pheonix dactylifera* (b) *Calotropis* (c) Lupine (*Lupinus*) (d) *Victoria*
161. Hybrid seeds have to be produced every year because -
(a) Hybrid plants become sterile in coming years
(b) They show more heterosis in coming years
(c) Hybrid vigour is not maintained beyond one generation as segregation of genes begins in the second generation
(d) Hybrid seed industry tends to increase cost of the seeds
162. An organic substance that can withstand environmental extremes and cannot be degraded by any enzyme is:
(a) Cuticle (b) Sporopollenin (c) Lignin (d) Cellulose
163. Wind pollination is common in
(a) Orchids (b) Legumes (c) Lilies (d) Grasses
164. Even in absence of pollinating agents seed setting is assured in
(a) *Commellina* (b) *Zostera* (c) *Salvia* (d) Fig
165. Which of the following statements one true-
(a) Endothecium lies behind epidermis
(b) Fusion of egg with male gamete is called apogamy
(c) symergids are lipoid
(d) The point at which funicle touches the ovule is called laplae
(a) (a) and (d) only (b) (a) and (b) only (c) (a) and (c) only (d) All are true

166.

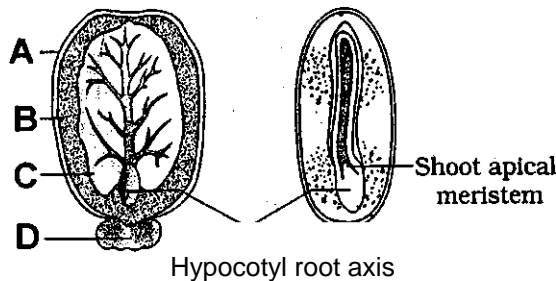


Identify the edible part (A, B, C and D) shown in the diagram –

- (a) A - seed (b) B - thalamus (c) C = Epicarp + Mesocarp (d) D = Endocarp

167. Collar like outgrowth that arises from the base of the ovule and forms a part of the integument is called -
 (a) caruncle (b) aril (c) operculum (d) fereculus
168. False fruits (thalamus also contributes to fruit formation) are found in -
 (a) Apple and pear (b) Strawberry (c) Cashewnut (d) All
169. Which of the following is not correct?
 (a) As the seed matures, its water content is reduced and seeds become relatively dry (10-15% moisture by mass)
 (b) The seed dormancy is the internal or innate inhibition of germination of normal or viable seeds
 (c) Embryo in dormant seed shows higher rate of general metabolic rate
 (d) Because of dormancy seeds remain viable for longer period and can be stored
170. Seed dormancy allows the plant to -
 (a) Overcome unfavourable climatic conditions
 (b) Develop healthy seeds
 (c) Reduce viability
 (d) Prevent deterioration of seeds

171.



The above diagrams are related to castor seeds. Identify A, B, C and D respectively -

- (a) Endosperm, seed coat, cotyledon and caruncle (b) Seed coat, endosperm, caruncle and cotyledon
 (c) Seed coat, cotyledon, endosperm and caruncle (d) Seed coat, endosperm, cotyledon and caruncle

172. What is the function of germ pore?
 (a) Emergence of radicle (b) Absorption of water for seed germination
 (c) Initiation of pollen tube (d) Release of male gametes
173. The gynoecium consists of many free pistils in flowers of
 (a) Aloe (b) Tomato (c) Papaver (d) Michelia
174. Which of the sequences is correct for embryogenesis in dicots?
 (a) Zygote → Globular stage → Proembryo → Heart shaped stage → Matured embryo
 (b) Zygote → Heart shaped stage → Globular stage → Matured embryo

(c) Zygote → Proembryo → Heart shaped stage → Globular stage → Matured embryo
 (b) Zygote → Proembryo → Globular stage → Heart shaped stage → Matured embryo

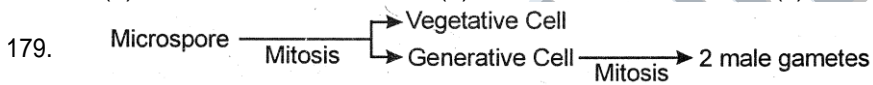
175. Nuclear or cellular nature of endosperm can be known at a -
 (a) Matur^stage (b) Cordate stage of embryo^
 (c) First and subsequent divisions of PEN (d) beginning of divisions in embryo

176. An ovule has generally how many embryo sac?
 (a) 1 (b) 3 (c) 4 (d) 8

177. Go through the above figure showing a dissected flower of *Hibiscus* showing pistil. Identify A, B, C and D respectively-
 (a) Hilum, Carpel, Ovary and thalamus
 (b) Stigma, Style, Ovary and thalamus
 (c) Stigma, style, ovary and placenta
 (d) Stigma, style, Gynophore, anthophore



178. Micropyle is found in
 (a) Seed (b) Ovule (c) Both ovule and seed (d) Fruit



Which of the following cells has more food and a large irregular shaped nucleus?

- (a) Vegetative cell (b) Generative cell
 (c) Microspore (d) Either Vegetative cell or Generative cell

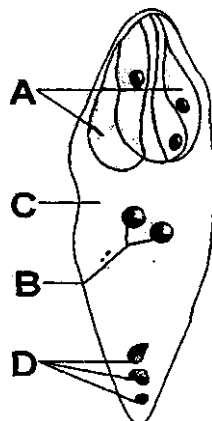
180. The inner wall of pollen grain -
 (a) Is thin, continuous and pecto cellulosic and is called intine
 (b) Comes out in the form of pollen tube through germopore
 (c) Is thick and consists of sporopollenin
 (d) a and b

181. The first division in a pollen grain results in formation of - ^ - '
 (a) a larger vegetative cell and smaller generative cell (b) a larger generative cell and smaller vegetative cell
 (c) 2 equal cells (d) 4 male gametes

182. Pollen grain has prominent apertures called where sporopollenin is
 (a) intine, germopore, absent (b) exine, germopore, absent
 (c) exine, germopore, present (d) exine, foramen ovale, absent

183. Pollen grains of different species show characteristic difference in -
 (a) Shapes, size and colours only (b) Shapes, sizes, colours and ploidy only
 (c) Shapes, sizes, colour and design only (d) Ploidy only

184.



Identify A, B, C and D structures shown in above diagram of female gametophyte -

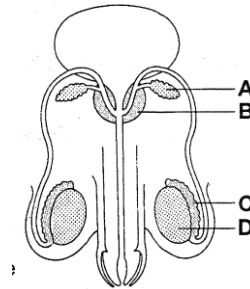
	A	B	C	D
(a)	Synergid	Polar nuclei	Central cell	Antipodal cells
(b)	Antipodal cells	Polar nuclei	Central cell	Synergids
(c)	Antipodal cells	Polar nuclei	Megaspore mother cell	Synergids
(d)	Filiform	Polar nuclei	Central cell	Arrtipodal cell

185. Which of the following statements is false about filiform apparatus?
- (a) The synergids have special cellular thickenings at the micropylar tip called filiform apparatus
 - (b) It plays an important role in guiding the pollen tubes into the synergid
 - (c) Both
 - (d) Pollen tube stimulates the formation of filliform apparatus
186. In an angiosperm, male plant is diploid and the female plant in tetraploid, endosperm will be-
- (a) Haploid
 - (b) Triploid
 - (c) Tetraploid
 - (d) Pentaploid

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	a	a	c	d	d	c	c	a	b	b	d	c	b	a	a	b	a	b	c	b
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	b	d	d	c	b	c	c	b	a	c	a	b	a	c	d	d	a	b	b	b
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	b	a	d	b	b	c	c	d	b	c	d	d	c	d	c	b	b	a	b	a
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	a	a	b	c	d	c	d	c	c	d	c	d	d	d		a	a	c	d	c
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	c	b	c	d	a	d	d	c	a	b	c	c	a	a	d	b	d	b	b	a
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	b	d	d	c	c	b	b	b	a	b	b	c	d	b	d	d	b	c	a	b
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	a	a	a	a	b	b	a	b	c	a	a	a	a	b	d	b	d	b	a	a
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	a	d	b	b	c	b	a	c	a	a	a	a	a	b	c	d	d	d	d	c
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	c	b	d	a	c	b	b	d	c	a	d	c	c	d	c	d	b	c	a	d
Ques.	181	182	183	184	185	186														
Ans.	a	b	c	a	d	d														

1. Human egg in-
 (a) Microlecithal (b) Merolecithal (c) Macrolecithal (d) Alecithal
2. The mammalian egg shows _____ cleavage-
 (a) Holoblastic equal (b) Heteroblastic unequal (c) Meroblastic (d) superficial
3. Which of the germ layers is best associated with the development of Leontopodium?
 (a) Ectoderm (b) Endoderm (c) Mesoderm (d) All of these
4. Which of the following signaling molecules is responsible for erectile function?
 (a) Acetylcholine (b) Nitric oxide (c) Dopamine (d) Carbon dioxide
5. Cells of Leydig are found in-
 (a) Liver (b) Ovary (c) Seminiferous tubules (d) Kidney
6. At menopause there is rise in urinary excretion of-
 (a) SHBG (b) FSH (c) LH (d) MSH
7. Sugar fructose is present in the secretion of -
 (a) Bartholin's gland (b) Cowper's gland (c) Prostate gland (d) Prostate gland
8. The differentiation of spermatids into spermatozoa is called-
 (a) Spermatogenesis (b) Spermiogenesis (c) Spermatocytogenesis (d) Spermatids
9. The accompanying diagram is a male reproductive system...,
 I. D produces sperms but not testosterone.
 II. D produces testosterone but not sperms.
 III. D produces sperms and testosterone.
 IV. A secretes a liquid rich in fructose and prostaglandins.
 Which of the following statements are correct?

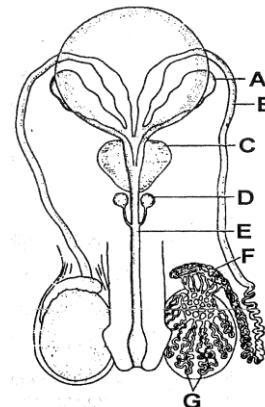


- (a) I and II (b) III and IV (c) All (d) None
10. Match each function below with the associated part or parts of the human male reproductive system shown in the figure.

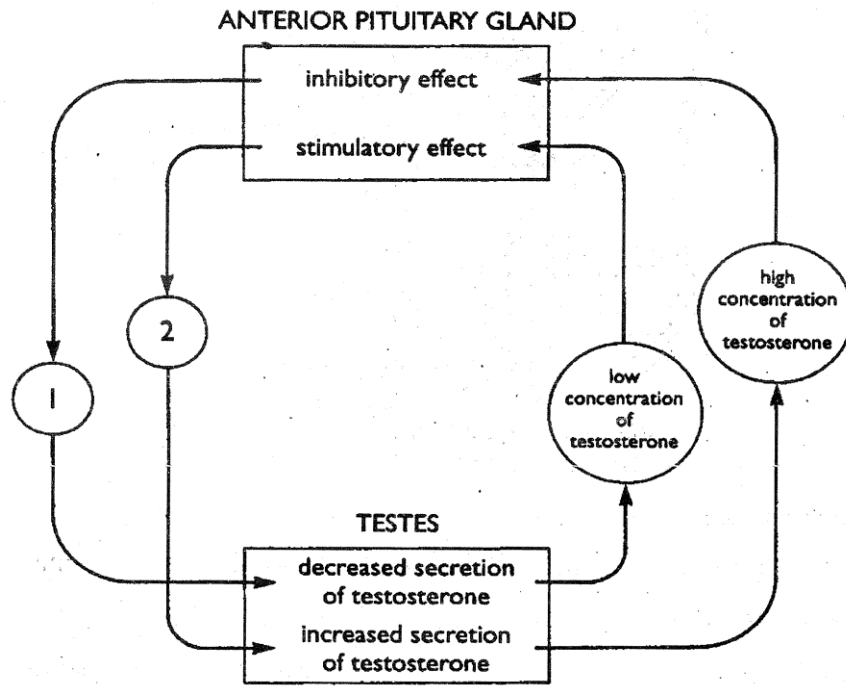
- I. Produces sperm.
- II. Conducts the sperm through the penis to the outside of the body.
- III. Produces seminal fluid.
- IV. Connects the epididymis with the urethra.

es sperm

- (a) I-G; II-E; III-A, C, D; IV-B; V-F
 (b) I-A, B; II-E; III-C, D; IV-G; V-F
 (c) I - G; II - F; III - A, B, C; IV - E; V - D
 -E; II - A, B, D; IV - C; V - G



11. The accompanying diagram shows the self-regulating effect of testosterone.



Which line in the following table correctly identifies the terms missing from circles 1 and 2?

Circle 1

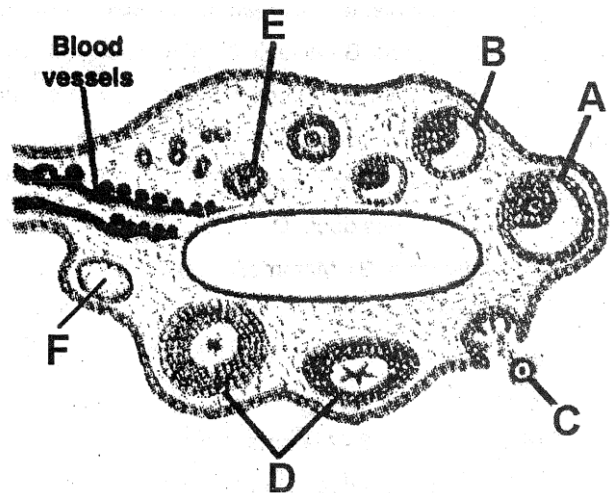
- (a) increased secretion of ICSH
- (b) decreased secretion of ICSH
- (c) increased secretion of FSH
- (d) decreased secretion of FSH

Circle 2

- decreased secretion of ICSH
- increased secretion of ICSH
- decreased secretion of FSH
- increased secretion of FSH

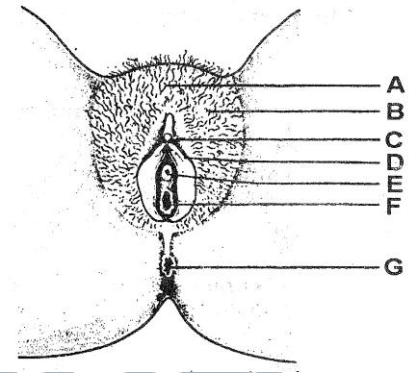
12. In given T.S. of human ovary. Identify A to F.

- (a) A - Secondary follicle, B - Tertiary follicle with antrum, C - Ovum, D - Corpus luteum, E - Primary follicle, F - Corpus albicans
- (b) A-Graafian follicle, B-Tertiary follicle with antrum, C - Ovum, D - Corpus spongiosum, E - Primary follicle, F - Corpus albicans
- (c) A- Graafian follicle, B -Tertiary follicle with antrum, C - Ovum, D - Corpus albicans, E - Primary follicle, F - Corpus luteum
- (d) A- Graafian follicle, B - Tertiary follicle with antrum, C - Ovum, D -Corpus luteum, E - Primary follicle, F - Corpus albicans



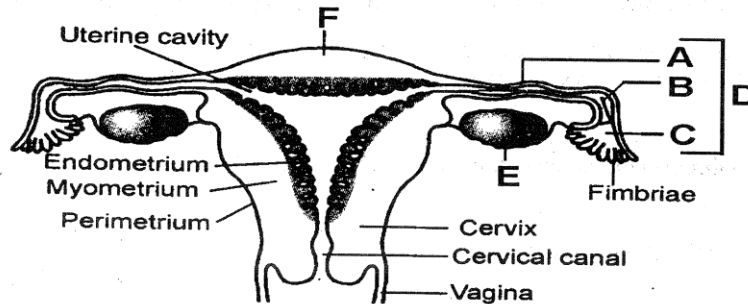
13. Label the following diagram of the vulva, using the alphabetized list of terms.

- I. Anus,
III. Labia majora
V. Mons pubis,
VII. vagina
- II. Glands clitoris,
IV. Labia minora,
VI. Urethra



- (a) A-V, B-IV, C-III, D-II, E-VI, F-VIII, G-I
(b) (a) A-V, B-III, C-II, D-IV, E-VI, F-VII, G-I
(c) A - II, B - III, C - V, D - IV, E - VI, F - VII, G - I
(d) A - V, B - VI, C - VII, D - IV, E - II, F - III, G - I

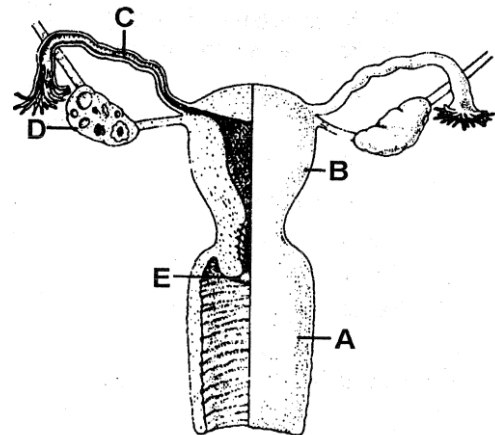
14. The following diagram refers to female reproductive system of human. Identify A to F –



- (a) A- Isthmus, B -Ampulla, C - Infundibulum, D - Fallopian tube, E - Ovary, F - Uterine fundus
(b) A-Ampulla, B - Isthmus, C - Infundibulum, D - Fallopian tube, E - Ovary, F - Uterine fundus
(c) A- Isthmus, B - Infundibulum, C -Ampulla, D - Fallopian tube, E - Ovary, F - Uterine fundus
(d) A-Ampulla, B-Infundibulum, C-Isthmus, D- Fallopian tube, E-Ovary, F- Uterine fundus

15. Match each function below with the associated part or parts of the human female reproductive system shown in the figure.

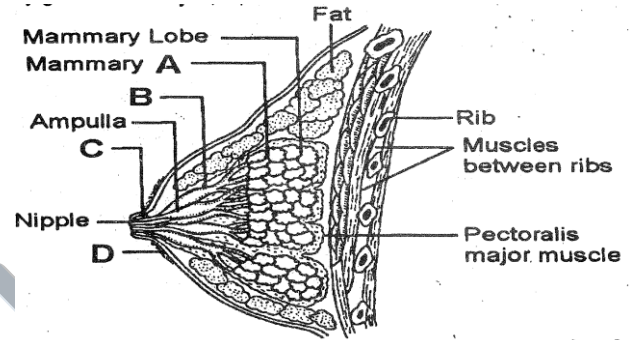
- I. Where is the egg produced?
II. Where does fertilization occur?
III. Where would implantation of a fertilized egg take place?
IV. Where are estrogen and progesterone produced?
V. What part receives the male penis during copulation?



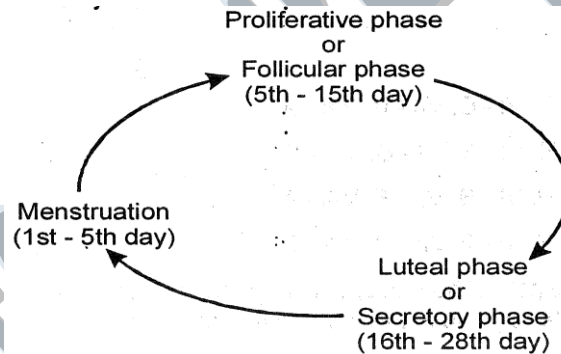
- (a) I-D, II-C, III-B, IV-E, V-A
(b) I-D, II-C, III-B, IV-A, V-E
(c) I-D, II-C, III-B, IV-D, V-A
(d) I-E, II-C, III-B, IV-D, V-A

16. Following is the diagrammatic sectional view of mammary gland. Identify A, B, C and D -

- (a) A - Gland, B - Mammary duct, C - Lactiferous duct, D-Areola
 (b) A - Alveolus, B - Mammary duct, C - Lactiferous duct, D - Areola
 (c) A-Alveolus, B - Lactiferous duct, C - Mammary duct, D - Areola
 (d) A - Alveolus, B - Mammary duct, C - Lactiferous duct, D - Lactogenic spot



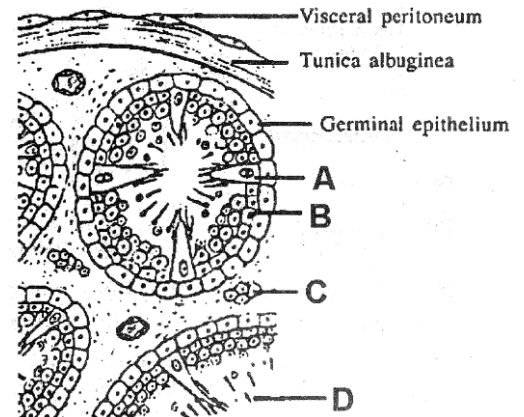
17. The events of the menstrual cycle are represented below. In which of the following option the level of FSH, LH and progesterone are mentioned correctly-



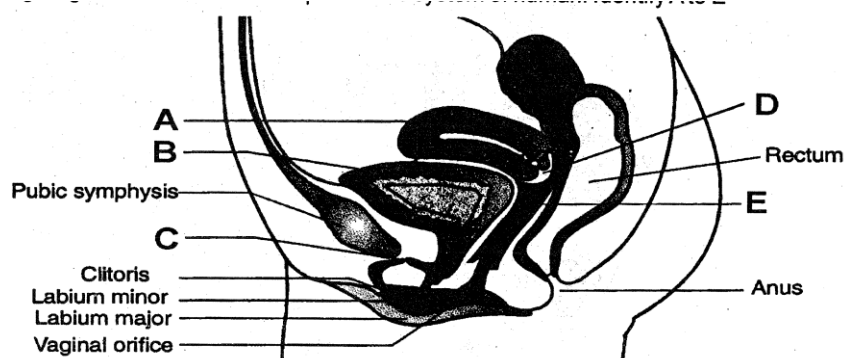
	13 th - 14 th day				21 st - 23 rd day		
	FSH	LH	Progesterone		FSH	LH	Progesterone
(a)	High	High	Low		Low	Low	High
(b)	High	High	High		Low	Low	Low
(c)	Low	Low	Low		High	High	High
(d)	Low	Low	High		High	High	Low

18. The below diagram refers to T.S. of testis showing sectional view of a few seminiferous tubules.

- (a) A - Sertoli cells, B - Spermatozoa, C - Interstitial cells, D-Sperms
 (b) A - Sertoli cells, B - Secondary spermatocyte, C - Interstitial cells, D - Sperms
 (c) A- Interstitial cells, B - Spermatogonia, C - Sertoli cells, D-Sperms
 (d) A- Sertoli cells, B - Spermatogonia, C - Interstitial cells, D-Sperms



19. I. The following diagram refers to female reproductive system of human. Identify A to E –



- (a) A- Urethra, B - Urinary bladder, C - Uterus, D - Cervix, E -Vagina
 (b) A - Uterus, B - Urinary bladder, C - Urethra, D - Vagina, E - Cervix
 (c) A- Urethra, B - Urinary bladder, C - Uterus, D - Cervix, E -Vagina
 (d) A - Uterus, B - Urinary bladder, C - Urethra, D - Cervix, E - Vagina

20. Identify the parts labelled (A to G) in the diagram of male reproductive system from the list I to X given along with.

I. Fundus

II. Uriniferous tubules

III. Seminiferous tubules

IV. Seminal vesicle

V. Prostate

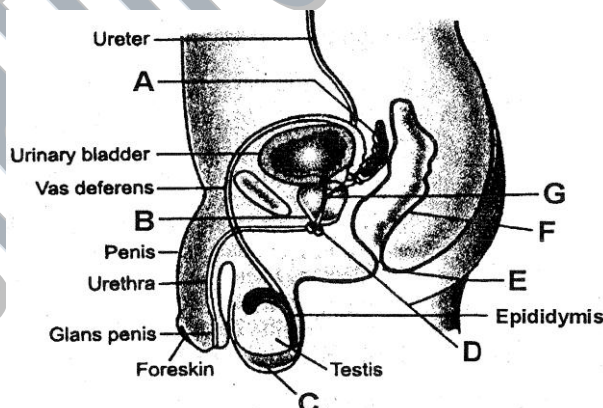
VI. Ejaculatory duct

VII. Rectum

VIII. Anus

IX Bulbourethral gland

X Scrotum



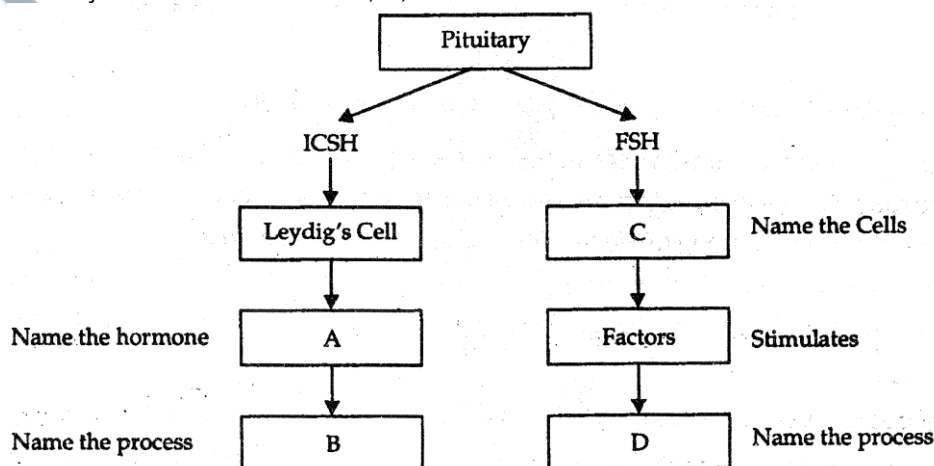
(a) A- IV, B - V, C - I, D - III, E - IX, F - X, G - II.

(b) A - V, B - III, C - I, D - II, E - IV, F - VI, G - VIII.

(c) A-IV, B-V, C-X, D-IX, E-VIII, F-VII, G-VI.

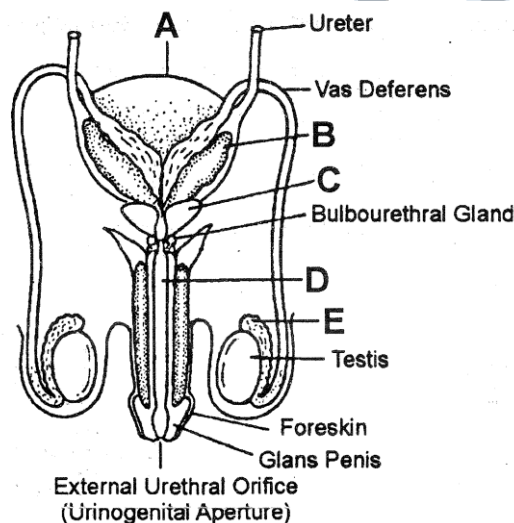
(d) A-X, B-IX, C-VIII, D - IV, E-III, F-II, G-

21. Given below is an incomplete chart showing influence of hormones on gametogenesis in males. Observe the chart carefully and fill in the blanks A, B, C and D.



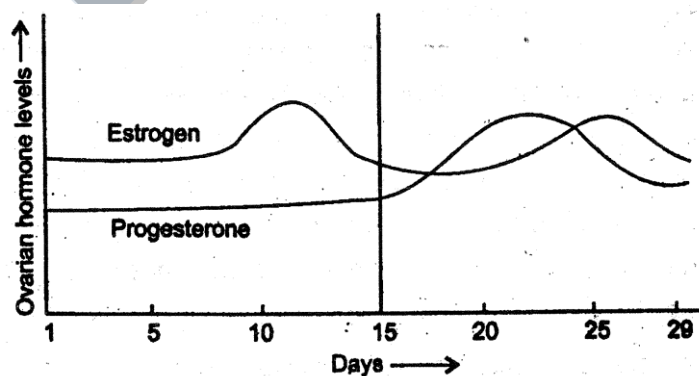
- (a) A - LH, B - Spermatogenesis, C - Sertoli cells, D - Spermiogenesis
- (b) A - Testosterone, B - Spermatogenesis, C - Testis, D - Spermiogenesis
- (c) A - Testosterone, B - Spermiogenesis, C - Sertoli cells, D - Spermatogenesis
- (d) A - Testosterone, B - Spermatogenesis, C - Sertoli cells, D - Spermiogenesis

22. Given below is the diagram of a male reproductive system. In which one of the options all the five parts A, B, C, D and E are correct?



- (a) A- Rectum, B - Seminal Vesicle, C - Prostate, D - Urethra, E - Epididymis
- (b) A- Urinary bladder, B - Seminal Vesicle, C - Prostate, D - Urethra, E - Epididymis
- (c) A - Urinary bladder, B - Prostate, C - Seminal Vesicle, D - Urethra, E - Epididymis
- (d) A- Urinary bladder, B - Seminal Vesicle, C - Prostate, D - Epididymis, E – Urethra

23. Read the graph and correlate the uterine events that take place according to the hormonal levels on (I) 6-15 days (II) 16-25 days (III) 26-28 days (if the ovum is not fertilized)



- (a) I - Degeneration of endometrium, II - Myometrium thickens, becomes vascularised, ready to receive and implant embryo, III - Regeneration of endometrium.
- (b) I - Degeneration of endometrium, II - Endometrium thickens, becomes vascularised, ready to receive and implant ovum, III - Regeneration of endometrium.
- (c) I - Degeneration of endometrium, II - Endometrium thickens, becomes vascularised, ready to receive and implant embryo, III - Regeneration of endometrium.
- (d) I - Regeneration of endometrium, II - Endometrium thickens, becomes vascularised, ready to receive and implant embryo, III - Degeneration of endometrium.

24. Fill up the blanks-

A functional mammary gland is characteristic of all female A . The mammary glands are paired structures (breasts) that contain glandular tissue and variable amount of fat. The glandular tissue of each breast is divided into 15-20 mammary lobes containing clusters of cells called ____B _____. The cells of C____ secrete milk, which is stored in the cavities (lumens) of alveoli. The alveoli open into mammary tubules. The tubules of each lobe join to form a ____D____ duct. Several E____ ducts join to form a wider mammary ampulla which is connected to E duct through which milk is sucked out.

(a) A - vertebrates, B - alveoli, C - alveoli, D - mammary, E - mammary, F - lactiferous.

(b) A- mammals, B - lactogen, C - alveoli, D - mammary, E - mammary, F - lactiferous.

(c) A - mammals, B - alveoli, C - alveoli, D - mammary, E - mammary, F - lactiferous.

(d) A- mammals, B - alveoli, C - alveoli, D - mammary, E - lactiferous, F - mammary

25. Given below is a statement with some blanks. Fill up the blanks correctly -

The male reproductive system consists of two testes. Each testis contains thin folded tubes called the A in which meiosis takes place to produce the male gametes, the sperms. These sperms move to the B (a highly coiled tube formed from the merging of the seminiferous tubules), and then to the C or sperm duct. The two vasa deferentia merge to form the urethra, which travels to the outside of the body through the penis. The cells located between the seminiferous tubules are called D cells and they are responsible for the formation of the male hormone, E

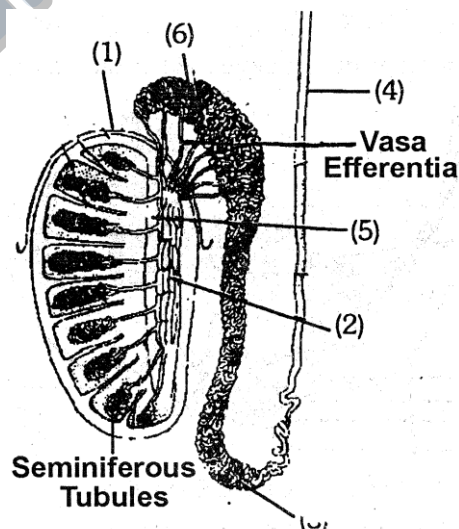
(a) A - Seminiferous tubules; B - epididymis; C - vas deferens; D - interstitial cells; E - testosterone

(b) A - Seminiferous tubules; B - epididymis; C - ejaculatory duct; D - interstitial cells; E - testosterone

(c) A- Seminiferous tubules; B - epididymis; C - vas deferens; D - interstitial cells; E - progesterone

(d) A - Uriniferous tubules; B - epididymis; C - vas deferens; D - interstitial cells; E – testosterone

26. The following diagram refers to L.S. of testis showing various parts. In which one of the options all the six parts are correct.



(a) 1 -Tunica Vaginis, 2 - Rete Testis, 3 - Caput Epididymis, 4 -Vas Deferens, 5 - Mediastinum Testis, 6 - Cauda Epididymis

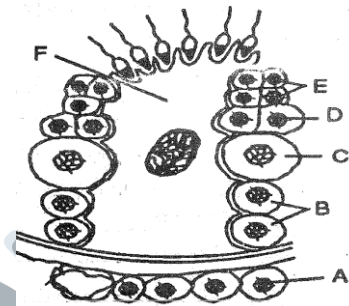
(b) 1 - Tunica Vaginis, 2 - Rete Testis, 3 - Cauda Epididymis, 4 - Mediastinum Testis, 5 - Vas Deferens, 6- Cauda Epididymis

(c) 1 -Tunica Vaginis, 2 - Rete Testis, 3 - Cauda Epididymis, 4 -Vas Deferens, 5 - Mediastinum Testis, 6- Cauda Epididymis

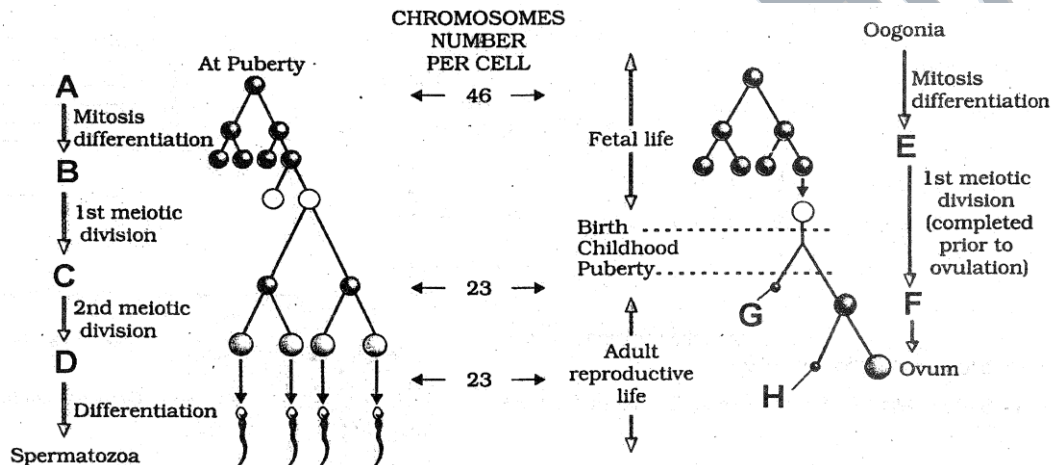
(d) 1 - Tunica Vaginis, 2 - Rete Testis, 3 - Caput Epididymis, 4 - Mediastinum Testis, 5 - Vas Deferens, 6 - Cauda Epididymis

27. In the following diagram of a portion of a seminiferous tubule identify the marked alphabets.

- (a) A- Leydig cell, B - Spermatogonium, C - Primary spermatocyte, D - Secondary spermatocyte, E - Spermatids, F - Sertoli cells.
 (b) A- Sertoli cells, B - Spermatogonium, C - Primary spermatocyte, D - Secondary spermatocyte, E - Spermatids, F - Leydig cell.
 (c) A- Leydig cell, B - Primary spermatocyte, C - Spermatogonium, D - Secondary spermatocyte, E - Spermatids, F - Sertoli cells.
 (d) A- Leydig cell, B - Spermatogonium, C - Primary spermatocyte, D - Secondary spermatocyte, E - Spermatozoa, F - Sertoli cells.

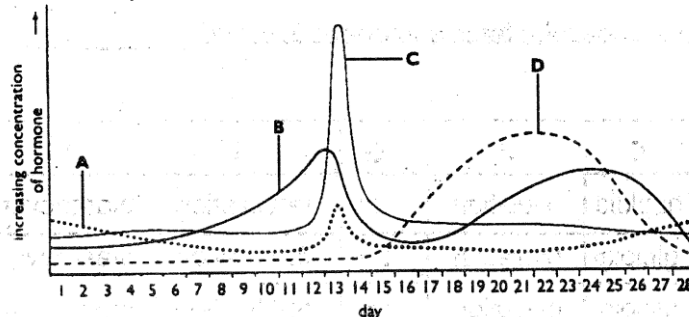


28. The following refers to spermatogenesis and oogenesis in human. Identify A to H correctly-



- (a) A - Spermatogonia, B - Secondary spermatocytes, C - Primary spermatocytes, D - Spermatids, E - Primary oocyte, F - Secondary oocyte, G - First polar body, H - Second polar body
 (b) A - Spermatogonia, B - Primary spermatocytes, C - Secondary spermatocytes, D - Spermatids, E - Secondary oocyte, F - Primary oocyte, G - First polar body, H - Second polar body
 (c) A - Spermatogonia, B - Primary spermatocytes, C - Secondary spermatocytes, D - Spermatids, E - Primary oocyte, F - Secondary oocyte, G - First polar body, H - Second polar body
 (d) A - Spermatogonia, B - Primary spermatocytes, C - Secondary spermatocytes, D - Spermatids, E - Primary oocyte, F - Secondary oocyte, G - Second polar body, H - First polar body

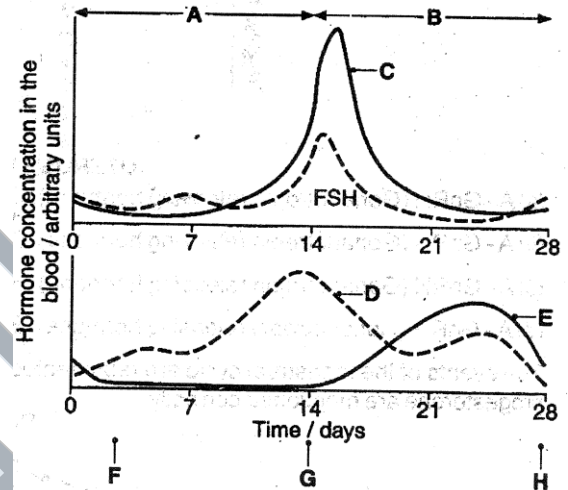
29. The following graph of relative concentrations of the four hormones present in the blood plasma of a woman during her menstrual cycle. Identify the hormones.



- | | A | B | C | D |
|-----|-----|--------------|-----|--------------|
| (a) | FSH | Progesterone | LH | Oestrogen |
| (b) | LH | Progesterone | FSH | Oestrogen |
| (c) | FSH | Oestrogen | LH | Progesterone |
| (d) | LH | Oestrogen | FSH | Progesterone |

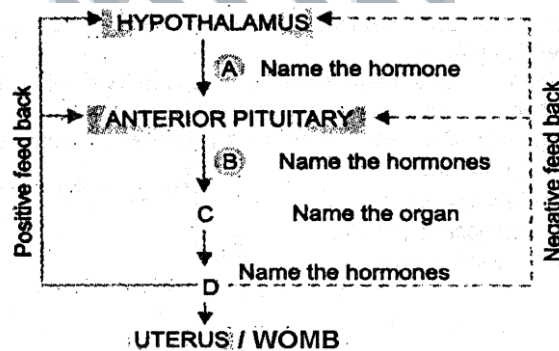
30. The adjacent diagram shows some of the changes in blood hormone concentration which occur during the menstrual cycle. Complete the diagram using labels from the following list

- I. Oestrogen
- II. Ovulation
- III. Repair of endometrium
- IV. Luteinising hormone
- V. Menstruation
- VI. Luteal phase
- VII. Progesterone
- VIII. Ovarian phase.



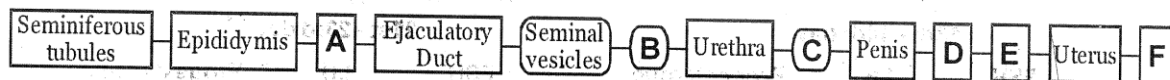
- (a) I - H, II - G, III - F, IV - E, V - D, VI - C, VII - B, VIII - A
- (b) I - D, II - E, III - F, IV - G, V - H, VI - A, VII - C, VIII - C
- (c) I - D, II - G, III - F, IV - C, V - H, VI - B, VII - E, VIII - A
- (d) I - A, II - C, III - E, IV - G, V - H, VI - F, VII - D, VIII - B

31. Given below is an incomplete flow chart showing influence of hormones on gametogenesis in human females. Study it carefully and fill in the blanks A, B, C and D –



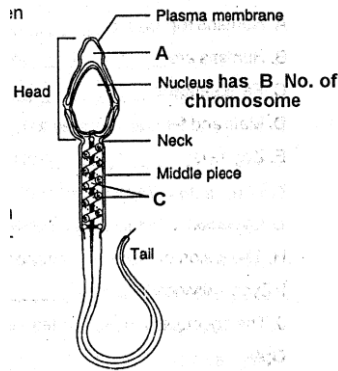
- (a) A- GnRH (Gonadotropin releasing hormone), B - Estrogen and Progesterone, G - Ovary, D - FSH and LH
- (b) A-GnRH(Gonadotropin releasing hormone), B - Progesterone and LH, C-Ovary, D - Estrogen and FSH
- (c) A- GnRH (Gonadotropin releasing hormone), B - FSH and Estrogen, C - Ovary, D - LH and Progesterone
- (d) A- GnRH (Gonadotropin releasing hormone), B - FSH and LH, C - Ovary, D - Estrogen and Progesterone

32. The following diagram shows the path of human sperm from the point of production to the point of fertilization having some missing structures indicated by A to F. Identify these missing structures



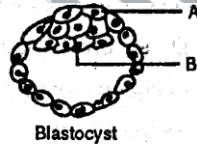
- (a) A- Vas deferens, B - Bulbourethral glands, C - Prostate gland, D - Vagina, E - Cervix, F - Oviduct
- (b) A- Vas deferens, B - Prostate gland, C - Bulbourethral glands, D - Vagina, E - Cervix, F - Oviduct \
- (c) A- Vas deferens, B - Prostate gland, C - Bulbourethral glands, D - Cervix, E - Vagina, F - Oviduct
- (d) A- Vas deferens, B - Prostate gland, C - Bulbourethral glands, D - Oviduct, E - Cervix, F – Vagina

33. The following belongs to human sperm. Identify A, B and C.



- (a) A - Acrosome, B - 46, C - Mitochondria
 (b) A - Acrosome, B - 23, C - Mitochondria
 (c) A-Lysosome, B - 23, C - Mitochondria
 (d) A - Acrosome, B - 23, C - Spirillum

34. Identify A and B, and their respective functions.

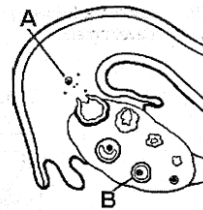


	A	B	Function of A	Function of B
(a)	Trophoblast	Inner cell mass	get attach to the endometrium	differentiated as embryo
(b)	Inner cell mass	Trophoblast	get attach to the endometrium	differentiated as embryo
(c)	Trophoblast	Inner cell mass	differentiated as embryo	get attach to the endometrium
(d)	Ectoderm	Endoderm	differentiated as embryo	get attach to the endometrium

35. This is refined to an gestation-
 (a) Period of pregnancy (b) Spermatisation (c) Fertilisation (d) Ovulation

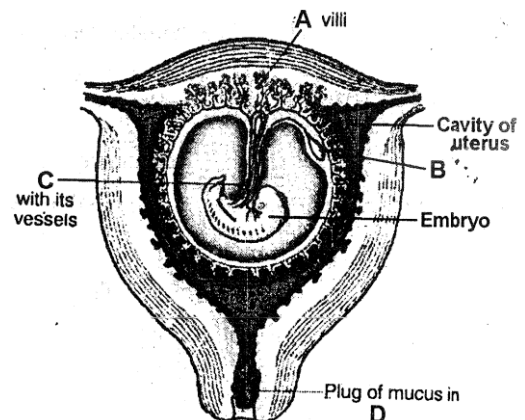
36. When did the structure labeled B in the given figure start to form?

- (a) in infancy
 (b) before birth
 (c) at the start of the menstrual cycle
 (d) at puberty



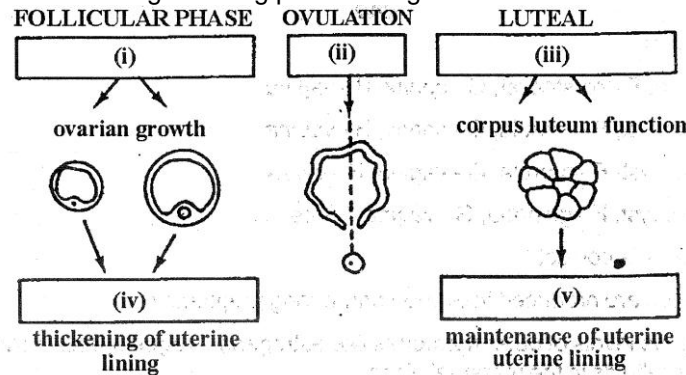
37. The given diagram refers to the human foetus within the uterus. Identify all the alphabets correctly -

- (a) A - Placenta, B - Yolk sac, C - Umbilical cord, D - Cervix
 (b) A - Placenta, B - Yolk sac, C - Umbilical cord, D - Vagina
 (c) A - Placenta, B - Amnion, C - Umbilical cord, D - Cervix
 (d) A - Uterine, B - Yolk sac, C - Umbilical cord, D - Cervix



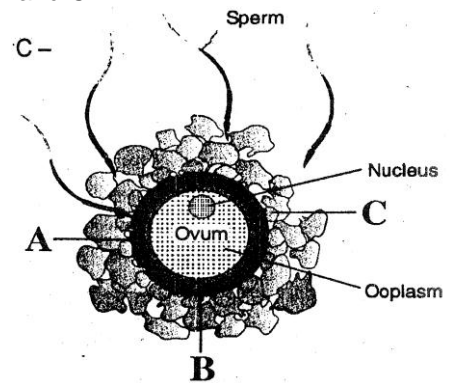
38. A human female has the maximum number of primary oocytes in her ovaries-
- At birth
 - Just prior to puberty
 - Early in her fertile years
 - Midway through her fertile years.

39. The figure below illustrates the changes taking place during the human menstruation cycle.



In each of the boxes shown in the figure write the name of the hormone, or ho/mones controlling the stage in the human menstrual cycle.

- (i) FSH, (ii) LH, (iii) LH, (iv) Estrogen, (v) Progesterone.
 - (i) LH, (ii) FSH, (iii) LH, (iv) Estrogen, (v) Progesterone.
 - (i) FSH, (ii) LH, (iii) FSH, (iv) Estrogen, (v) Progesterone.
 - (i) FSH, (ii) LH, (iii) LH, (iv) Progesterone, (v) Estrogen.
40. Blastopore normally develops into-
- Anus
 - Coculum
 - Pectum
 - Apperix
41. The following refers to ovum surrounded by few sperms. Identify A, B and C
- A-Zone pellucida, B - Perivitelline space, C - Corona reticulata
 - A-Zone pellucida, B - Vitelline membrane, C - Corona radiata
 - A- Zone pellucida, B - Perivitelline space, C - Corona radiata
 - A- Oolemma, B - Perivitelline space, C - Corona radiata
- (d) A - Uterine, B - Yolk sac, C - Umbilical cord, D - Cervix



42. When blastocoel is formed in it, the embryo is called-
- Gantrula
 - Blastula
 - Neunula
 - Morula
43. Given below are ten statements (A to J), each with one blank. Select the option which correctly fill up the blanks in all statements -

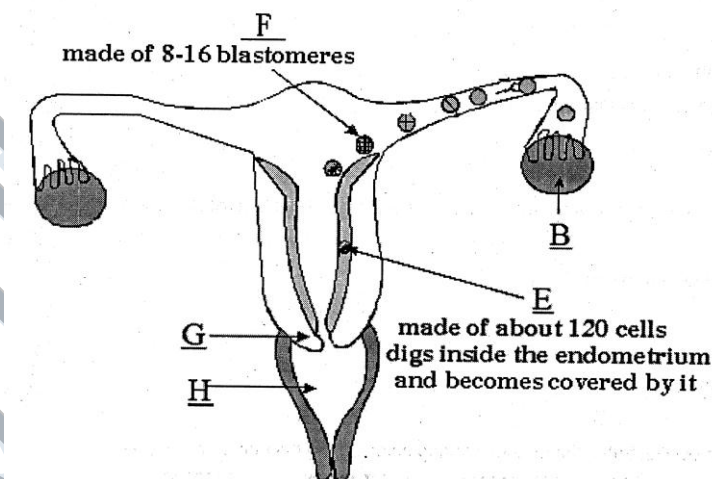
Statements:

- Humans reproduce _____ (asexually/sexually)
- Humans are _____ (oviparous, viviparous, ovoviviparous)
- Fertilisation is _____ in humans (external/internal)
- Male and female gametes are _____ (diploid/haploid)
- Zygote is _____ (diploid/haploid)
- The process of release of ovum from a mature follicle is called _____
- Ovulation is induced by a hormone called _____
- The fusion of male and female gametes is called _____
- Zygote divides to form _____ which is implanted in uterus.
- The structure which provides vascular connection between fetus and uterus is called _____

Options :

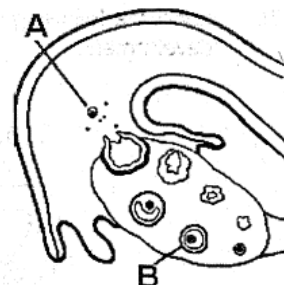
	A	B	C	D	E	F	G	H	I	J
(a)	asexually	viviparous	external	diploid	haploid	ovulation	LH	fertilization	blastocyst	placenta
(b)	sexually	viviparous	external	haploid	diploid	ovulation	LH	fertilization	blastocyst	placenta
(c)	asexually	viviparous	internal	haploid	diploid	ovulation	LH	fertilization	blastocyst	placenta
(d)	sexually	viviparous	internal	haploid	diploid	ovulation	LH	fertilization	blastocyst	placenta

44. What is the function of amnions ?
 (a) Perspiration (b) Incretion (c) Protection from shock (d) Nutrition
45. Which of the following set is developed from endoderm-
 (a) Nervous system, urinary bladder, eye (b) Liver, Pancreas, thymus
 (c) Liver, Connective tissue, Lungs (d) Thymus, spinal cord, nervous system
46. The Sertoli cells are located in
 (a) Caput epididymis (b) Cauda epididymis (c) Seminiferous tubules (d) Germinal epithelium.
47. Label the following diagram which illustrates fertilization followed by cleavage and the early stages of embryonic development.



Identify B, E, F, G and H.

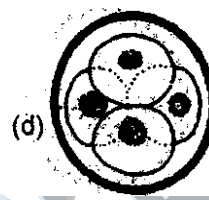
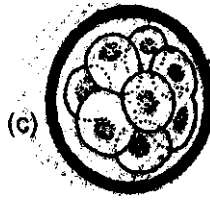
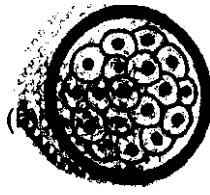
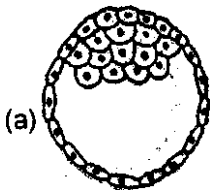
- (a) B - ovary, E - morula, F - blastocyst, G - cervix, H - vagina
 (b) B - ovary, E - blastocyst, F - morula, G - cervix, H - vagina
 (c) B - ovary, E - blastocyst, F - morula, G - vagina, H - cervix
 (d) B - ovary, E - blastocyst, F - gastrula, G - vagina, H - cervix
48. What stage of the menstrual cycle is characterized by the event labeled A in figure?
 (a) corpus luteum formation
 (b) ovulation
 (c) flow
 (d) fertilization



49. Which of the following groups of organ develop from mesoderm-
- (a) Nervous system, epidermis, internal ear (b) Thyroid, pancreas kidney
(c) Pineal gland, stomodaeum (d) Heart, spleen, gonads
50. Mark the odd one :
- (a) Endometrium (b) Corpus luteum (c) Acrosome (d) Graafian follicle.
51. Which of the statements is correct?
- (a) hCG, hPL and relaxin are produced in women only during pregnancy.
(b) During pregnancy the levels of other hormones like estrogens, progestogens, cortisol, prolactin, thyroxine, etc., are increased severalfold in the maternal blood.
(c) Increased production of these hormones is essential for supporting the fetal growth, metabolic changes in the mother and maintenance of pregnancy.
(d) All of the above
52. Corpus luteum produces
- (a) Estradiol (b) Testosterone (c) Progesterone (d) None.
53. In a mammal sperm, spirally arranged mitochondria around the axial filament are present in the region of
- (a) Head (b) Middle piece (c) Principal piece of tail (d) End piece of tail
54. In which animal, the testes are abdominal during embryonic stages but migrate to scrotum just before birth where they remain throughout life
- (a) Elephants (b) Men (c) Rats (d) Whales.
55. Abdominal passage which connects abdominal cavity with the scrotal sac in mammals is known as
- (a) Spermathecal canal (b) Neurenteric canal (c) Inguinal canal (d) Haversian canal.
56. Fill up the blanks -
After one month of pregnancy, the embryo's A is formed. By the end of the B month of pregnancy, the foetus develops limbs and digits. By the end of C most of the major organ systems are formed, for example, the limbs and external genital organs are well-developed. By the end of D the body is covered with fine hair, eye-lids separate, and eyelashes are formed. ^
- (a) A - heart, B - second, C - First trimester, D - second trimester
(b) A - heart, B - second, C - First month, D - second month
(c) A - heart, B - second, C - First week, D - second week
(d) A - heart, B - fourth, C - First trimester, D - second trimester
57. The structure formed after release of ova from graafian follicles and secretory in nature is
- (a) Corpus callosum (b) Corpus luteum (c) Corpus albicans (d) Corpus stratum.
58. Ovulation takes place by
- (a) FSH (b) LH (c) Progesterone (d) Estradiol.

59. Clitoris in mammals is
 (a) Homologous to penis (b) Analogous to penis
 (c) Functional penis in female (d) Non-functional penis in male.
60. When released from ovary, human egg contains
 (a) Only Y chromosome (b) 2 X chromosome (c) 1 X chromosome (d) XY chromosomes
61. Number of spermatozoan, a single primary spermatocyte produces in spermatogenesis, is
 (a) One (b) Two (c) Four (d) Eight.
62. A gland associated with the male reproductive organs of mammals is
 (a) Prostate gland (b) Phallic gland (c) Mushroom gland (d) Conglobate gland.
63. Which one is primary sex organ?
 (a) Scrotum (b) Penis (c) Testis (d) Prostate
64. Path of sperms from penis to the site of fertilization is :
 (a) Oviduct-uterus-Cervix-vagina (b) Vagina-cervix-uterus-oviduct
 (c) Vagina - uterus - oviduct - cervix (d) Vagina - oviduct - cervix - uterus
65. The process of releasing the ripe female gamete from the ovary is called
 (a) Parturition (b) Ovulation (c) Fertilisation (d) Implantation.
66. Failure of descending testes into the scrotum is known as
 (a) Paedogenesis (b) Castration (c) Cryptorchidism (d) Impotency.
67. A human female has the maximum number of primary oocytes in her ovaries-
 (a) At birth (b) Just prior to puberty
 (c) Early in her fertile years (d) Midway through her fertile years
68. Which part of the male reproductive system is the place where sperm complete the maturation process?
 (a) the prostate gland (b) the epididymis (c) the vas deferens (d) the penis
69. Human placenta is derived from
 (a) Ectoderm (b) Trophoblast (c) Endoderm (d) Mesoderm.
70. Tunica albuginea covers
 (a) penis (b) testis (c) ovule (d) stroma
71. Which of the following develops from endoderm?
 (a) Brain (b) Kidneys (c) Oonads (d) Lungs.
72. All tissues can be formed from
 (a) ectoderm (b) endoderm (c) mesoderm (d) stem cells

73. In which of the following embryonic stages does the implantation take place?



74. The duct opening at the tip of the nipple is

- (a) oviduct (b) lactiferous duct (c) vulva (d) uterus

75. The cavity of gastrula is called

- (a) Blastocoel (b) Coelom (c) Archenteron (d) Haemocoel.

76. An accessory genital gland is

- (a) seminal vesicle (b) Cowper's gland (c) prostate gland (d) all of these

77. Sperms of mammals depend for movement on

- (a) Only tail (b) Middle piece (c) Head only (d) Tail & middle piece.

78. Why can't a woman get pregnant again during pregnancy?

- (a) A woman ovulates during pregnancy, but the oviducts are plugged with protective mucus to prevent sperm from entering.
 (b) High levels of HCG in women's bodies kill sperm.
 (c) A woman can't have intercourse during pregnancy due to the presence of a protective mucus plug that develops in the cervix.
 (d) High levels of estrogen and progesterone, secreted by the corpus luteum or placenta during pregnancy, inhibit the secretion of gonadotropins and prevent ovulation.

79. Foetal membranes provide

- (a) Protection of embryo (b) Nutrition of embryo (c) Respiration of embryo (d) All the above.

80. Estrogen and progesterone are secreted by

- (a) placenta (b) ova (c) testis (d) kidney

81. Placenta in human is

- (a) Haemochorial (b) Metadiscoidal (c) Deciduous (d) All

82. The connective tissue called tunica albuginea covers the

- (a) liver (b) kidney (c) ovary (d) primary follicle

83. Fertilizing protein is found on

- (a) acrosome (b) sperm head (c) sperm surface (d) egg membrane

84. In human beings
 (a) Chorion and Amnion are well-developed (b) Allantois and Yolk sac are less developed
 (c) Yolk cell does not have yolk (d) All the above.
85. Below urinary bladder is situated
 (a) seminal vesicle (b) epididymis (c) prostate gland (d) prepuce
86. Gonads are derived from
 (a) Mesoderm (b) Endoderm (c) Ectoderm (d) Mesoderm & Endoderm
87. Leydig cells are found in
 (a) testis (b) ovary (c) vasa deferens (d) scrotum
88. Termination of gastrulation is indicated by
 (a) Obliteration of blastocoel (b) Obliteration of archenteron
 (c) Closure of blastopore (d) Closure of neural tube.
89. Which of the following events occurs at the same time that menstruation is beginning?
 (a) The levels of LH and FSH are "spiking."
 (b) The levels of estrogen and progesterone in the ovarian hormone cycle are on the rise.
 (c) The corpus luteum is degenerating.
 (d) Ovulation is occurring.
90. Morphogenesis starts with
 (a) Morulation (b) Blastulation (c) Gastrulation (d) Neurulation.
91. Kidney and genital organs are formed from
 (a) endoderm (b) ectoderm
 (c) mesoderm (d) ectoderm and mesoderm
92. Extrusion of second polar body from egg nucleus occurs
 (a) After entry of sperm but before fertilization (b) After fertilization
 (c) Before entry of sperm (d) No relation with sperm entry
93. Gametes are formed during
 (a) spermatogenesis (b) oogenesis (c) gametogenesis (d) spermiogenesis
94. During pregnancy one of the following is excreted
 (a) Progesterone (b) LH (c) PSH (d) HCG

95. Stroma is present in the T.S. of
 (a) penis (b) testis (c) ovary (d) liver
96. Haemopoietic in embryo is
 (a) Amnion (b) Chorion (c) Allantois (d) Yolk sac
97. Scrotum is associated with
 (a) ovary (b) liver (c) testis
98. Corpus spongiosum muscle is present in
 (a) testis (b) ovary (c) penis (d) epididymis
99. Embryonic urinary bladder is
 (a) Amnion (b) Chorion (c) Allantois (d) All.
100. Archenteron is the future
 (a) Stomodaeum (b) Proctodaeum (c) Cavity of alimentary canal (d) Coelom
101. Parturition means
 (a) Separation of blastocysts (b) Development of embryo
 (c) Process of birth (d) Contraction of uterus
102. Blastocyst remains attached to
 (a) uterine wall (b) foetus (c) Fallopian tube (d) none of these
103. Fertilization in the female reproductive tract most often takes place in the
 (a) ovary. (b) upper third of the oviduct.
 (c) lower third of the oviduct. (d) uterus.
104. Spermatids are changed into spermatozoa through
 (a) Spermiogenesis (b) Spermiation (c) Spermatogenesis (d) Spermatosis.
105. Which one of the following is the correct matching of the events occurring during menstrual cycle? .
 (a) Proliferate phase: rapid regeneration of myometrium and maturation of Graafian follicle
 (b) Secretory phase: development of corpus luteum and increased secretion of progesterone
 (c) Menstruation : breakdown of myometrium and ovum not fertilised
 (d) Ovulation : LH and FSH attain peak level and sharp fall in the secretion of progesterone
106. Sertoli cells are regulated by the pituitary hormone
 (a) FSH (b) GH (c) Prolactin (d) LH.
107. In humans, at the end of the first meiotic division, the male germ cells differentiate into the
 (a) spermatids (b) spermatozoa
 (c) primary spermatocytes (d) secondary spermatocytes.
108. The remains of the placenta and embryonic membranes that are expelled during birth are called the _____
 (a) cervix (b) umbilical cord (c) amniotic fluid (d) afterbirth

109. Which part of ovary in mammals acts as an endocrine gland after ovulation?
 (a) stroma (b) germinal epithelium (c) vitelline membrane (d) Graafian follicle
110. In the menstrual cycle, on what day does the flow stage begin?
 (a) day 5 (b) day 1 (c) day 28 (d) day 14
111. In male body, the production of oestrogen takes place at
 (a) Leydig's cell, adrenal cortex & graafian follicle (b) liver, adrenal cortex & renal medulla
 (c) adrenal cortex, secondary oocyte & liver (d) liver, sustentacular cell & adrenal cortex.
112. At what point in development does an embryo become a fetus?
 (a) by the twenty-eighth week (b) by the eighth week
 (c) by the thirty-ninth week (d) by the nineteenth week
113. At which stage of follicle maturation does ovulation occur, transforming the follicle into the corpus luteum?
 (a) tertiary follicle (b) primary follicle (c) secondary follicle (d) quaternary follicle
114. _____ is the hormone responsible for the expression of secondary sex characteristics in human females.
 (a) Testosterone (b) Estrogen (c) FSH (d) LH
115. Which of the following statements concerning menopause is correct?
 (a) Menopause occurs because all of the female's follicles become hormone-producing corpus luteum at once.
 (b) Menopausal symptoms are a result of a decrease in the production of FSH and LH.
 (c) The onset of menopause is primarily due to follicle atresia.
 (d) Menopause will occur when a female has only about 250,000 follicles left in her ovaries.
116. When FSH reaches the testes, it causes the production of _____.
 (a) secondary sex characteristics (b) testosterone
 (c) LH (d) sperm cells
117. In the human female, menstruation can be deferred by the administration of
 (a) combination of FSH and LH (b) combination of estrogen and progesterone
 (c) FSH only (d) LH only.
118. The menstrual cycle begins during _____.
 (a) childhood (b) puberty (c) adulthood (d) infancy
119. In human adult females oxytocin
 (a) stimulates pituitary to secrete vasopressin (b) causes strong uterine contractions during parturition
 (c) is secreted by anterior pituitary (d) stimulates growth of mammary glands
120. Withdrawal of which hormone is the immediate cause of menstruation.
 (a) Estrogen (b) FSH (c) FSH-RH (d) Progesterone
121. If mamm an ovum fails to get fertilized, which one of the following is unlikely ?
 (a) corpus luteum will disintegrate (b) progesterone secretion rapidly declines
 (c) estrogen secretion further decreases (d) primary follicle starts developing

122. _____ is the process by which a baby is pushed out of the uterus and passes out of the mother's body,
 (a) Expulsion (b) Dilation (c) Birth (d) Labor
123. Which germinal layer develops first during embryonic development
 (a) Endoderm (b) Mesoderm (c) Ectoderm (d) Both A and B.
124. Females stop releasing eggs and hormone secretions slow down during _____.
 (a) puberty (b) fertilization (c) menopause (d) ovulation
125. Notochord, skeletal system and dermis of skin are derived from
 (a) Ectoderm (b) Endoderm (c) Mesoderm (d) All the above.
126. Which of the following events occurs within the uterine tubes?
 (a) oogenesis (b) fertilization (c) embryonic development (d) A, B and C are all correct.
127. The fluid that provides energy for the sperm cells comes from the _____.
 (a) urethra (b) bulbourethral glands (c) prostate gland (d) seminal vesicles
128. _____ keeps the embryo attached to the wall of the uterus.
 (a) The vagina . (b) The blastula (c) The fallopian tube (d) The umbilical cord
129. Which of these is the name for human embryonic development?
 (a) a placenta (b) a navel (c) a blastocyst (d) a contraction
130. Which of these is NOT a gland that contributes to the production of sperm?
 (a) thyroid gland (b) bulbourethral gland (c) seminal vesicles (d) prostate gland
131. In which part of the female reproductive anatomy does a fetus develop?
 (a) the vagina (b) the ovary (c) the uterus (d) the cervix
132. Which of the following events is correctly matched with the time period in a normal menstrual cycle?
 (a) Release of egg — 5th day
 (b) Endometrium regenerates — 5-10 days
 (c) Rise in progesterone level — 1-15 days
 (d) Endometrium secretes nutrients for implantation — 11 -18 days
133. The second maturation division of the mammalian ovum occurs -
 (a) Shortly after ovulation before the ovum makes entry into the Fallopian tube
 (b) Until after the ovum has been penetrated by a sperm
 (c) Until the nucleus of the sperm has fused with that of the ovum
 (d) In the Graafian follicle following the first maturation division
134. Which of the following does NOT occur during implantation?
 (a) The embryo secretes enzymes that digest away part of the endometrium.
 (b) The embryo is drawn into the endometrium and becomes surrounded by it.
 (c) The embryo forms finger-like projections that burrow into the uterine wall.
 (d) The embryo develops into a hollow ball with a fluid-filled interior.
135. The first movements of the foetus and appearance of hair on its head are usually observed during which month of pregnancy?
 (a) fourth month (b) fifth month (c) sixth month (d) third month

136. The region of the embryo that first develops a close connection with the uterus is called the -
 (a) chorion (b) amnion (c) placenta (d) endometrium
137. A change in the amount of yolk and its distribution in the egg will affect
 (a) pattern of cleavage (b) number of blastomeres produced
 (c) fertilization (d) formation of zygote
138. Which of the following sequences shows the correct order of the events that occur during foetal development?
 (a) cleavage →• fertilisation →^ differentiation →> implantation
 (b) fertilisation →• cleavage →• implantation →• differentiation
 (c) cleavage →>> fertilisation →> implantation →+> differentiation
 (d) fertilisation →+• cleavage →>> differentiation →^ implantation
139. The correct sequence of spermatogenetic stages leading to the formation of sperms in a mature human testis is
 (a) spermatogonia - spermatocyte - spermatid - sperms
 (b) spermatid - spermatocyte - spermatogonia - sperms
 (c) spermatogonia - spermatid - spermatocyte - sperms
 (d) spermatocyte - spermatogonia - spermatid - sperms
140. FSH was administered to a group of rats who had their anterior pituitary glands removed. Compared with the control group of normal rats, which of the following events did NOT take place in the experimental animals?
 (a) proliferation of the endometrium (b) maturation of a Graafian follicle
 (c) development of the corpus luteum (d) build-up of oestrogen in the bloodstream
141. Foetal ejection reflex in human female is induced by
 (a) release of oxytocin from pituitary (b) fully developed foetus and placenta
 (c) differentiation of mammary glands (d) pressure exerted by amniotic fluid
142. During the last week of the luteal phase of the menstrual cycle the following events occur.
 1. A rapid drop in progesterone level takes place.
 2. Menstruation begins.
 3. Lack of LH leads to the degeneration of the corpus luteum.
 4. The endometrium is no longer maintained.
 The correct order in which these occur is
 (a) 1,3,4,2 (b) 3, 1,4,2 (c) 1,3, 2,4 (d) 3, 1,2,4
143. Seminal plasma in humans is rich in
 (a) fructose and calcium but has no enzymes
 (b) glucose and certain enzymes but has no calcium
 (c) fructose and certain enzymes but poor in calcium
 (d) fructose, calcium and certain enzymes
144. The following list gives some effects brought about directly by hormones.
 1. promotion of sperm production
 2. stimulation of oestrogen production
 3. development of corpus luteum
 4. maturation of Graafian follicle
 5. stimulation of progesterone production

Which of these are ALL effected by FSH?

- (a) 1,2 and 4 (b) 1,3 and 5 (c) 2,3 and 4 (d) 2, 4 and 5

145. Human testes are positioned in an external sac rather than in the abdominal cavity

- (a) to shorten the distance that semen must travel during ejaculation.
(b) to shorten the distance that sperm must swim during insemination.
(c) so the testes can be kept away from the urinary bladder.
(d) so the testes can be kept cooler than the body's interior.

146. In human the gestation period is-

- (a) 7 months (b) 9 months (c) 25 months (d) 8 months

147. Which of the cells are the ones that actually develop into the embryo?

- A. Trophoblast B. Inner cell mass C. Extra embryonic membrane (D) Endoderm

- (a)A,B (b)A,B,e (c) Only B (d)A,B,G,D

148. The temperature of scrotal pouch remains normally at

- (a) 4° F less than normal body temp. (b) 6° F higher than normal body temp,
(c) 5° F higher than normal body temp. (d) 7° F less than normal body temp.

149. A. Umbilical cord contain blood vessel from embryo

B. Umbilical cord joins the placenta and the embryo

C. Umbilical cord carries wastes and nutrients

D. It contains blood vessel from mother

- (a) All are correct (b) All are incorrect (c) Only D is incorrect (d) Only A is correct

150. The development of human embryo completes is-

- (a) 180 days (b) 300 days (c) 250 days (d) 266 days

151. 280 days of gestation period are calculated from the time of-

- (a) Last ministration (b) Fertilisation (c) Next ministration (d) Puberty

152. In the human female, menstruation can be deferred by the administration of

- (a) combination of estrogen and progesterone (b) FSH only
(c) LA only (d) combination of FSH and LH

153. Secretion / Secretions of which one / ones is / are essential for maturation and motility of sperms.

- A. Epididymis B. Vasdeferens C. Seminal vesicle D. Prostrate glands

- (a)A, B (b)A,B,C (c)C,D (d) A.B.C, D

154. Which of the following is the correct sequence of hormonal increase beginning with menstruation?

- (a) estrogen, progesterone, FSH (b) FSH, progesterone, estrogen
(c) FSH, estrogen, progesterone (d) estrogen, FSH, progesterone

155. During menstrual cycle there is morphological and physiological change in

- A. Uterus B. Ovary C. Penis D. Labia majora

- (a)A, B (b)A,B,C (C) C, D (d) A.B.C.D

156. Regarding fertilization which among the following statement is incorrect?

- (a) It restores diploid. condition in the zygote
(b) Paternal and maternal sets contribute to the diploid number without causing any variation
(c) It activates egg both physiologically and metabolically
(d) It determines the sex of the offspring

157. During mid-cycle (menstruation cycle):
 A. LH and FSH attain a peak level
 B. Ovulation occurs
 C. Maximum progesterone level in blood
 D. Regression of corpus luteum occurs.
 (a) A, B (b) A, B, G (c) C, D (d) A, G, D
158. Some important events in the human female reproductive cycle are given below. Arrange the events in a proper sequence
 A — Secretion of FSH B — Growth of corpus luteum C — Growth of the follicle and oogenesis D — Ovulation
 E — Sudden increase in the levels of LH
 (a) A → D → C → E → B (b) B → A → C → D → E
 (c) C → A → D → B → E (d) A → C → E → D → B
159. Fetus is nourished by-
 (a) Placenta (b) Yolk (c) Blood (d) Phagocytosis
160. When do the three germinal layers differentiate-
 (a) Blastula (b) Gastrula (c) Cleavage (d) Fertilisation
161. Correct sequence in development is -
 (a) Fertilization → Zygote → Cleavage → Morula → Blastula → Gastrula
 (b) Fertilization → Zygote → Blastula → Morula → Cleavage → Gastrula
 (c) Fertilization → Cleavage → Morula → Zygote → Blastula → Gastrula
 (d) Cleavage → Zygote → Fertilization → Morula → Blastula → Gastrula
162. Menstruation cycle consists of:
 A. Follicular / proliferate phase B. Luteal / secretory phase
 C. Menstrual / bleeding phase D. Ejaculatory phase
 (a) A, B (b) A, B, C (c) C, D (d) A, B, C, D
163. A sperm of human consists of:
 A. Head B. Neck C. Middle piece D. Tail
 (a) A, B (b) A, B, C (c) C, D (d) A, B, C, D
164. Correct sequence of hormone secretion from beginning of menstruation is -
 (a) FSH, progesterone, estrogen (b) Estrogen, FSH, progesterone
 (c) FSH, estrogen, progesterone (d) Estrogen, progesterone, FSH
165. Which among the following statements is correct to indicate the difference between sperm and egg
 (a) Cytoplasm in sperm is more abundant than in egg
 (b) Nucleus is clear in sperm and very compact in egg
 (c) Mitochondria form a sheath in egg and diffused in sperm
 (d) Accessory membranes are absent in sperm but present in egg
166. In human the male accessory gland / glands include
 A. Seminal vesicle B. Prostate C. Testes D. Bulbourethral
 (a) A, B (b) A, B, C (c) A, B, C (d) A, B, C, D
167. Menstruation is triggered by an abrupt decline in the amount of
 (a) luteinising hormone (b) follicle-stimulating hormone
 (c) estrogen (d) progesterone

168. Each seminiferous tubule is lined on its inside by:
 A. Male germ cells B. Interstitial cells C. Leydig cells D. Sertoli cells
 (a) A, B (b) A, B, C (c) A, D (d) A, B, G, D
169. What would happen if vasa deferentia of man were cut?
 (a) sperms are nonnucleated (b) semen is without sperms
 (c) sperms are nonmotile (d) spermatogenesis does not occur
170. The female external genitalia include:
 A. Mons pubis B. Ovary C. Labia majora and minora D. Hymen and clitoris
 (a) A, B (b) A, B, C (c) A, C, D (d) A, B, C, D
171. The initial step during fertilization of egg is-
 (a) Perpetration of sperm into ovum (b) Fertilisation antifertilizin reaction
 (c) Formation of fertilizing reaction cone (d) Formation of fertilization membrane
172. Parts of the human female reproductive system are
 A. Penis B. Vagina C. Uterus D. Fallopian tube
 (a) A, B (b) A, B, C (c) C, D (d) A, B, C, D
173. The wall of uterus has
 A. Ectoderm B. Perimetrium C. Myometrium D. Endometrium
 (a) A, B (b) B, C, D (c) C, D (d) A, B, C, D
174. **Column I** **Column II**
 I. Hyaluronidase (A) Graafian follicle
 II. Corpus luteum (B) Mammary gland
 III. Colostrum (C) Progesterone
 IV Antrum (D) Acrosomal reaction
 (a) I-B, II-A, III-D, IV-C (b) I-D, II-B, III-C, IV-A
 (c) I-D, II-C, III-B, IV-A (d) I-D, II-C, III-A, IV-B
175. The structures derived from mesoderm are
 A. kidney B. brain C. urinary bladder D. heart
 (a) A, B (b) A, B, C (c) A, D (d) A, B, C, D
176. Found associated with woman's mammary gland
 A. Nipple B. Lactiferous duct C. Uterus D. Vulva
 (a) A, B (b) A, B, C (c) C, D (d) A, B, C, D
177. FSH in males
 (a) Stimulates the Leydig cells for the secretion of testosterone
 (b) Induces the appearance of secondary sexual characters (ft) Acts on sertoli cells that help in spermiogenesis
 (d) Is also known as ICSH
178. Milk secreted from the cells of alveoli of mammary lobes reaches nipple through lactiferous duct (L), mammary duct (M), Mammary tubule (T) and Mammary ampulla (A) in the following order
 (a) TMAL (b) MTLA (c) MTAL (d) ATML
179. What is true about menstruation in human
 (a) It stops during pregnancy (b) It only occurs if the egg is not fertilized
 (c) Menstrual phase is followed by follicular phase (d) All of these

180.

Column I

- I. Testis
- II. Vulva
- III. Prostatic fluid
- IV. Production of ova

Column II

- (A) Gives specific smell to semen
- (B) Oogenesis
- (C) Contain in scrotum
- (D) Labia majora

181. Which one of the following is not the function of placenta ? It

- (a) Secretes estrogen
- (b) Facilitates removal of carbon dioxide and waste material from embryo
- (c) Secretes oxytocin during parturition
- (d) Facilitates supply of oxygen and nutrients to embryo

182. Which one of the following statements is false in respect of viability of mammalian sperm ?

- (a) Sperm is viable for only up to 24 hours.
- (b) Survival of sperm depends on the pH of the medium and is more active in alkaline medium.
- (c) Viability of sperm is determined by its motility.
- (d) Sperms must be concentrated in a thick suspension

183. Which can be seen in the transverse section of human testis?

- | | | | |
|------------------------|------------------------|----------|------------------|
| A. Germinal epithelium | B. Seminiferous tubule | C. Ova | D. Sertoli cells |
| (a) A, B, D | (b) A, B, C | (c) C, D | (d) A, B, C, D |

184. A. During fertilization, a sperm comes in contact with the zona pellucida layer and induces the changes in the membrane that block the entry of additional sperm.

B. The milk produced during initial few days of lactation is called Colostrum having antibodies.

C. In human beings, menstrual cycle ceases around 50 years of age. It is called menopause.

D. After one month of pregnancy major organ system are formed.

- | | | | |
|---------------------|-----------------------|------------------|--------------------------|
| (a) All are correct | (b) All are incorrect | (c) D is correct | (d) All correct except D |
|---------------------|-----------------------|------------------|--------------------------|

185.

Column I

- I. Semen
- II. Birth canal
- III. Penis
- IV. Seminiferous tubule

Column II

- (A) Clitoris
- (B) Testicular lobules
- (C) Vagina
- (D) Prostate gland
- (b) I-D, II-B, III-C, IV-A
- (d) I-D, II-C, III-A, IV-B

(a) I-B, II-A, III-D, IV-C

(c) I-D, II-C, III-B, IV-A

186. Structures which are seen in the T. S of an ovary are

- | | | | |
|-----------------------|------------------------|------------------|----------------|
| A. Graafian follicles | B. Germinal epithelium | C. Sertoli cells | D. Stroma. |
| (a) A, B, D | (b) A, B, C | (c) C, D | (d) A, B, C, D |

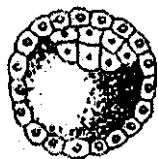
187. Most of the organs/system in foetus are formed by the end of

- | | | | |
|-------------------------------|-------------------------------|-------------------------------|-----------------|
| (a) 1 st trimester | (b) 2 nd trimester | (c) 3 rd trimester | (d) First month |
|-------------------------------|-------------------------------|-------------------------------|-----------------|

- 188.
- | | |
|--|---|
| <p>Column I</p> <p>I. Inguinal canal</p> <p>II. Clitoris</p> <p>III. Seminiferous tubules</p> <p>IV. Polar body</p> <p>(a) I-B, II-A, III-D, IV-C</p> <p>(c) I-D, II-C, III-B, IV-A</p> | <p>Column II</p> <p>(A) Homologous to penis</p> <p>(B) Testis</p> <p>(C) Connection of scrotum with abdomen</p> <p>(D) Oogenesis</p> <p>(b) I-D, II-B, III-C, IV-A</p> <p>(d) I-D, II-C, III-A, IV-B</p> |
|--|---|
189. In ovary we can find:
- | | | | |
|--|--|--|---|
| <p>A. Primary follicle</p> <p>(a) A, B</p> | <p>B. Graafian follicle</p> <p>(b) A, B, C</p> | <p>C. Blood vessel</p> <p>(c) C, D</p> | <p>D. Corpus luteum</p> <p>(d) A, B, C, D</p> |
|--|--|--|---|
190. A sectional view of mammary gland shows:
- | | |
|---|--|
| <p>A. Nipple + Areola</p> <p>C. Antibodies + Pectoral major muscles + Ribs</p> <p>(a) A, B, D</p> | <p>B. Mammary lobe, alveolus and duct.</p> <p>D. Ampulla + Lactiferous duct</p> <p>(b) A, B, C</p> <p>(c) C, D</p> <p>(d) A, B, C, D</p> |
|---|--|
191. The release of sperms from Seminiferous tubules is called
- | | | | |
|---------------------------|------------------------|-------------------------|--------------------------|
| <p>(a) Spermiogenesis</p> | <p>(b) Ejaculation</p> | <p>(c) Spermination</p> | <p>(d) None of these</p> |
|---------------------------|------------------------|-------------------------|--------------------------|
- 192.
- | | |
|---|---|
| <p>Column I</p> <p>I. Urethra</p> <p>II. Androgen/Testosterone</p> <p>III. Lutein cells</p> <p>IV. Ovary</p> <p>(a) I-B, II-A, III-D, IV-C</p> <p>(c) I-D, II-C, III-B, IV-A</p> | <p>Column II</p> <p>(A) Interstitial cells</p> <p>(B) Corpus luteum</p> <p>(C) Passage for urine and sperms</p> <p>(D) Oogenesis</p> <p>(b) I-D, II-B, III-C, IV-A</p> <p>(d) I-D, II-C, III-A, IV-B</p> |
|---|---|
193. Female accessory ducts are constituted by:
- | | | | |
|------------------------------------|-------------------------------------|----------------------------------|---------------------------------------|
| <p>A. Oviducts</p> <p>(a) A, B</p> | <p>B. Uterus</p> <p>(b) A, B, C</p> | <p>C. Vagina</p> <p>(c) C, D</p> | <p>D. Ovary</p> <p>(d) A, B, C, D</p> |
|------------------------------------|-------------------------------------|----------------------------------|---------------------------------------|
- 194.
- | | |
|--|--|
| <p>Column I</p> <p>I. Endometrium</p> <p>II. Menopause</p> <p>III. Fallopian tube</p> <p>IV. Vagina</p> <p>(a) I-B, II-A, III-D, IV-C</p> <p>(c) I-D, II-C, III-B, IV-A</p> | <p>Column II</p> <p>(A) Copulation chamber in female</p> <p>(B) Site of implantation of zygote</p> <p>(C) Cessation of menstrual cycle in female</p> <p>(D) Site of fertilization in female</p> <p>(b) I-D, II-B, III-C, IV-A</p> <p>(d) I-D, II-C, III-A, IV-B</p> |
|--|--|
195. During embryonic development the heart beat begins at the end of
- | | | | |
|-------------------------------------|-------------------------------------|---------------------------------|---------------------------------|
| <p>(a) 1st trimester</p> | <p>(b) 2nd trimester</p> | <p>(c) 1st month</p> | <p>(d) 2nd month</p> |
|-------------------------------------|-------------------------------------|---------------------------------|---------------------------------|
196. In a normal pregnant woman, the amount of total gonadotropin activity was assessed. The result expected was
- | |
|--|
| <p>(a) High level of circulating FSH and LH in the uterus to stimulate implantation of the embryo</p> <p>(b) High level of circulating HCG to stimulate endometrial thickening</p> <p>(c) High level of FSH and LH in uterus to stimulate endometrial thickening</p> <p>(d) High level of circulating HCG to stimulate estrogen and progesterone synthesis</p> |
|--|
- 197.
- | | |
|---|---|
| <p>Column I</p> <p>I. Acrosome</p> <p>II. Leydig's cells or interstitial cells</p> <p>III. Graafian follicles</p> <p>IV. Hymen</p> <p>(a) I-B, II-A, III-D, IV-C</p> <p>(c) I-D, II-C, III-B, IV-A</p> | <p>Column II</p> <p>(A) Ovary</p> <p>(B) Vagina</p> <p>(C) Sperm</p> <p>(D) Testis</p> <p>(b) I-D, II-B, III-C, IV-A</p> <p>(d) I-D, II-C, III-A, IV-B</p> |
|---|---|
198. The penis is :
- | | |
|---|---|
| <p>A. Copulatory organ</p> <p>C. With glans penis, that is covered with fore skin</p> <p>(a) A, B</p> | <p>B. External genitalia</p> <p>D. Composed of non-erectile tissue</p> <p>(b) A, B, C</p> <p>(c) C, D</p> <p>(d) A, B, C, D</p> |
|---|---|

199. Peretration of ovun by sperm during fertilization is done by the-
 (a) Certiosome (b) Mitochondria (c) Acrosome (d) none of these
200. Which one / ones is / are incorrect?
 A. The first menstrual discharge menarche
 B. Meiosis is peculiar to gonads
 C. Spermiation is the release of sperms from sertoli cells.
 D. Spermatogonium has 23 chromosomes in its nucleus.
 (a) A, B (b) A,B,C (c) D (d) A, B,C, D
201. **Column I**
 I. Morula
 II. Polyspermy
 III. Implantation
 IV Prolactin
 (a) I-B, II-A, III-D, IV-C
 (c) I-D, II-C, III-B, IV-A
- Column II**
 A) Fertilization membrane
 (B) Solid ball of cells
 (C) Mammary gland
 (D) Endometrium
 (b) I-D, II-B, III-C, IV-A
 (d) I-D, II-C, III-A, IV-B
202. Which is unpaired gland in male reproductive system of human
 (a) Prostate gland (b) Seminal vesicle (c) Cowper's gland (d) Bertholin gland
203. Set of chromosomes present in primary spermatocyte of human being is
 A. diploid/2N B. 44 + XY C. 22 + X D. 22 + Y
 (a) A,B (b) A,B,C (c) C, D (d) A,B,C,D
204. If for some reason, the vasa efferentia in the human reproductive system get blocked, the gametes will not be transported from
 (a) Vagina to uterus (b) Testes to epididymis
 (c) Epididymis to vas deferens (d) Ovary to uterus
205. Which is not the accessory duct in male reproductive system of human
 (a) Vas efferent (b) Seminiferous tubule (c) Epididymis (d) Vas deferens
206. The secretory phase in the human menstrual cycle is also called :
 (a) luteal phase and lasts for about 6 days (b) follicular phase lasting for about 6 days
 (c) luteal phase and lasts for about 13 days (d) follicular phase and lasts for about 13 days
207. Immediately after implantation, the inner cell mass differentiate into:
 A. Ectoderm B. Mesoderm C. Myometrium D. Endoderm
 (a) A,B,D (b) A, B, C (c) C,D (d) A, B,C, D
208. A blastocyst :
 A. Consists of trophoectoderm B. Includes Archenteron
 C. Inner cell mass D. Includes blastocoel
 (a) A, B (b) A,B,C (c) C,D (d) A,C,D
209. **Column I**
 I. Acre-some
 II. Endpmetrium
 III. Polar body
 IV. Clitoris
 (a) I-B, II-A, III-D, IV-C
 (c) I-D, II-C, III-B, IV-A
- Column II**
 (A) Rudimentary erectile tissue
 (B) Uterus
 (C) Oogenesis
 (D) Spermatozoan
 (b) I-D, II-B, III-C, IV-A
 (d) I-D, II-C, III-A, IV-B
210. The fertilization in human occurs at the junction of
 (a) Infundibulum&ulla (b) isthmus and fundus
 (c) Ampulla and isthmus (d) cervix and fundus

211. Identify the human developmental stage shown below as well as the related right place of its occurrence in a normal pregnant woman, and select the right option for the two together.



Options:

- | | Developmental stage | Site of occurrence |
|-----|---------------------|----------------------------------|
| (a) | Latemorula | Middle Part of Fallopian tube |
| (b) | Blastula | End part of Fallopian tube |
| (c) | Blastocyst | Uterine wall |
| (d) | 8 . celled morula | Starting point of Fallopian tube |
212. Out of the following which are the parts of reproductive system of a man?
- | | | | |
|------------|-------------------|---------------------|-----------------|
| A. Urethra | B. Fallopian tube | C. Ejaculatory duct | D. Labia minora |
| (a) A, C | (b) A, B, C | (c) C, D | (d) A, B, C, D |
213. Fallopian tube consists of:
- | | | | |
|------------|-------------|-------------|-----------------|
| A. Isthmus | B. Cervix | C. Ampulla | D. Infundibulum |
| (a) A, B | (b) A, B, C | (c) A, C, D | (d) A, B, C, D |
214. Menstrual flow occurs due to lack of
- | | | | |
|---------|--------------|-----------------|------------------|
| (a) FSH | (b) Oxytocin | (c) Vasopressin | (d) Progesterone |
|---------|--------------|-----------------|------------------|
215. Which match/ Matches is/are correct?
- | | |
|-----------------------------|---------------------------------|
| A. Urethra – single | B. Prostate gland-single |
| C. Seminal vesicle – single | D. Bulbourethral gland - paired |
| (a) A, B | (b) A, B, D |
| (c) C, D | (d) A, B, C, D |
216. About which day in a normal human menstrual cycle does rapid secretion of LH (Popularly called LH-surge) normally occurs
- | | | | |
|-------------------------|--------------------------|--------------------------|--------------------------|
| (a) 5 th day | (b) 11 th day | (c) 14 th day | (d) 20 th day |
|-------------------------|--------------------------|--------------------------|--------------------------|
217. Which one / ones is pair correct match?
- | | |
|----------------------------|---------------------------------|
| A. Solid ball – Morula | B. Hollow ball - Blastocyst |
| C. Child birth – Colostrum | D. Daughter cells - Blastomeres |
| (a) A, B, D | (b) A, B, C |
| (c) C, D | |
218. What happens during fertilisation in humans after many sperms reach close to the ovum?
- | |
|---|
| (a) Cells of corona radiata trap all the sperms except one |
| (b) Only two sperms nearest the ovum penetrate zona pellucida |
| (c) Secretions of acrosome helps one sperm enter cytoplasm of ovum through zona pellucida |
| (d) All sperms except the one nearest to the ovum lose their tails |
219. The sperm and the egg make different contributions to zygote. What statement/ statements about their contributions is / are true?
- | | |
|--|---|
| A. Sperm contribute most of the mitochondria | B. Egg contribute most of the cytoplasm |
| C. Both sperm and egg contribute haploid nucleus | D. Both sperm and egg contribute centrioles |
| (a) A, B | (b) B, G |
| (c) C, D | (d) A, B, C, D |

220. In human female the blastocyst
 (a) Forms placenta even before implantation
 (b) Gets implanted into uterus 3 days after ovulation
 (c) Gets nutrition from uterine endometrial secretion only after implantation
 (d) Gets implanted in endometrium by the trophoblast cells
221. The point of sperm entry during fertilization form-
 (a) Centre of rotation of embryo (b) Dorsal lip of blastopore
 (c) Arin of cleavage (d) Grey crescent
222. Immediately after ovulation, the mammation egg is covered by a membrane known as-
 (a) Chorion (b) Zona pellucida (c) Coronaradiata (d) Vitelline membrane
223. No menstruation cycle occurs
 A. Before puberty B. After 50 years
 C. During lactation D. Bet. puberty & menopause
 (a)A,B (b)A, B, C (c)C,D (d)A, B,C, D
224. Fertilizim are emitted by-
 (a) Immature egg (b) Mature egg (c) Sperm (d) Polar bodies
225. Signals from fully developed foetus and placenta ultimately lead to parturition which requires the release of:
 (a) Estrogen from placenta (b) Oxytocin from maternal pituitary
 (c) Oxytocin from foetal pituitary (d) Relaxin from placenta
226. Relaxin is secreted by -
 (a) Placenta (b) Corpus luteum (in the later phase of pregnancy)
 (c) Both a and b (d) Pituitary
227. head of sperm consists of-
 (a) Nucleus (b) Acrosome (c) Mitochondria (d) Acrosome and nucleus
228. Hormones secreted by human placenta are
 A. human chorionic gonadotrophin (hCG) B. human placenta! lactogen (hPL)
 C. estrogen and progesterone D. Relaxin
 (a)A,B (b)A,B, C, D (c)C,D (d)A,B,C
229. Which of the following are primary sex organs?
 A. Scrotum B. Vagina C. Testes D. Ovary
 (a) A, B (b)A,B,C (c)C,D (d) A, B, C, D
230. Middle piece of mammalian sperm contains-
 (a) Nucleus (b) Centrioles (c) Mitochondria (d) Vacuole
231. Out of the following which are the parts of mature human sperm?
 A. Acrosome B. Axoneme C. Ampulla D. Neck
 (a)A,B (b)A, B,D (c) C, D (d)A, B, C, D
232. Moment of sperm is done by-
 (a) Head (b) Midpiece (c) Acrosome (d) Tail
233. In human beings uterus is
 A. Single in number B. also called womb. C. Like an inverted pear D. Supported by ligaments
 (a)A,B (b,)A,B,C (c) C, D (d)A, B, C,D
234. How many ova and sperms will be produced from 100 secondary oocytes and 100 secondary spermatocyte during gametogenesis in human.
 (a) 100 ova and 100 sperms (b) 50 ova and 100 sperms
 (c) 100 ova and 200 sperms (d) 200 ova and 200 sperms
235. Which match / matches is / are incorrect.
 A. Spermatogonium -46 chromosomes B. Spermatid - 46 chromosomes
 C. Sperm - 23 chromosomes D. Sec. spermatocyte - 23 chromosomes
 (a) Only B (b)A, B, C (c)C, D (d)A, B, C,D
236. **Column I**
 I. Proliferative phase
 II. feydid's cell
 . III. Spermiogenesis
 IV Sfljretory phase
 (a) I-B, II-A, III-D, IV-C
 (c) I-D, II-C, III-B, IV-A
- Column II**
 (A) Testosterone
 (B)Estrogen
 (C) Progesterone
 (D)Spermatid
 (b) I-D,II-B, III-C, IV-A
 (d) I-D, II-C, III-A, IV-B

237. How many sperm are produced from one primary spermatocyte-
 (a) 8 (b) 6 (c) 2 (d) 4
238. Active movement of sperms in at the rate of-
 (a) 1.5 – 3.0 cm/min (b) 1.5-3.0 mm/min (c) 1.5/3.0 m/ min (d) 1.5–3.0m/he
239. Sperms move actively in female genital tract by-
 (a) Creeping (b) Gliding (c) Swimming (d) Jet propulsion
240. Primary oocyte in-
 (a) Haploid (b) Diploid (c) Polyploid (d) None of the above
241. Secondary oocyte in-
 (a) Haploid (b) Diploid (c) Polyploid (d) None of the above
242. Identify the stage that undergoes meiosis-
 (a) Primary spermatocytes (b) Secondary spermatocytes
 (c) Both a and b (d) Spermatogonia
243. Ovulation in human female normally takes place during menstrual cycle-
 (a) At the end of mid-secretory phase (b) At the end of proliferations phase
 (c) Just before the end of secretory phase (d) At the beginning of proliferation phase
244. The phase of menstrual cycle that lasts for about 7-8 days is-
 (a) Follicular phase (b) Luteal phase (c) Ovulatory phase (d) Maturation phase
245. During a woman's life she produces-
 (a) 400 eggs (b) 4000 eggs (c) 365 eggs (d) 40 eggs
246. Discharge of mature ovum from graafian follicle is known as-
 (a) Oogenesis (b) Ovulation (c) Spermatogenesis (d) Abortion
247. Estrous cycle is characteristic of-
 (a) Human females (b) Mammalian females
 (c) Mammalian females other than primates (d) Mammals
248. Which of the following shows correct sequence of phases in menstrual cycle ?
 (a) Menstruation, Ovulation, Luteal, Proliferation (b) Proliferation, Ovulation, Luteal, Menstruation
 (c) Menstruation, Ovulation, Luteal, Gestation (d) Menstruation, Proliferation, Luteal, Gestation
249. During menstrual discharge following things are thrown out-
 (a) Endometrial cells, Blood, Unfertilised oocyte (b) Unmated gonadotropin hormones
 (c) Egg cells, Corpus albicans, Blood, Atretic follicles (d) Only Atretic follicles
250. The oocyte from ovary is released into-
 (a) Fallopian tube (b) Uterus (c) Abdominal cavity (d) Blood
251. Endometrium undergoes thickening due to presence of _____ hormones,
 (a) Oestrogen (b) Progesterone (c) Both a and b (d) None of these
252. End of menstrual cycle is known as-
 (a) Parturition (b) Menopause (c) Menarche (d) Implantation
253. The small fingerlike projections formed near the distal end of fallopian tubes are known as-
 (a) Villi (b) Fimbriae (c) Both (d) None of these
254. Layers of uterus from outside in are-
 (a) Myometrium, Endometrium and Perimetrium
 (b) Epimetrium, Myometrium and Endometrium
 (c) Epimetrium, Myometrium and Endometrium
 (d) Endometrium, Myometrium and Perimetrium
255. In Cryptorchidism-
 (a) Spermatogenesis fails to occur
 (b) Maturation of sperms does not occur
 (c) Testes descend in inguinal canal
 (d) None of these
256. Position of testis is described as-
 (a) Etoperitoneal (b) Intra-abdominal (c) Intra-abdominal (d) None of these
257. The number of sperms contained in one ejaculation is _____ millions
 (a) 2-4 (b) 200-400 (c) 20-40 (d) 2000-4000
258. pH of semen is-
 (a) Acidic (b) Basic (c) Neutral (d) Any of these

259. The sex organ that never develops in human male is _____
 (a) Testis (b) Penis (c) Mammary gland (d) All of these
260. In oögamete fertilization involves-
 (a) A large motile female gamete and small non-motile male gamete
 (b) A small non-motile female gamete and a large motile male gamete
 (c) A large non-motile female gamete and small motile male gamete
 (d) A large motile female gamete and a small motile male gamete

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	d	a	c	b	c	b	d	b	b	a	b	d	b	a	c	b	a	d	d	c
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	d	b	d	c	a	c	a	c	c	c	d	b	b	a	a	b	a	a	a	a
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	c	b	d	c	b	c	b	b	d	c	d	c	b	b	c	a	b	b	a	c
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	c	a	c	b	b	c	a	b	b	b	d	d	a	b	c	d	d	d	d	a
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	d	c	d	d	c	a	b	a	c	c	c	a	c	d	c	d	c	c	c	c
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	c	c	b	a	b	a	d	d	d	b	a	b	a	b	c	d	b	b	b	d
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	c	d	a	c	c	d	d	d	c	a	c	b	b	d	b	a	a	b	a	c
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	b	b	d	a	d	b	c	d	c	d	a	a	d	c	c	b	a	d	a	b
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	a	b	d	c	d	c	d	c	b	c	b	d	b	c	c	a	c	a	d	a
Ques.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
Ans.	c	a	a	d	d	a	a	d	d	a	c	c	b	a	c	d	b	b	c	c
Ques.	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
Ans.	a	a	a	b	b	c	a	d	b	c	c	a	c	d	b	c	a	c	b	d
Ques.	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
Ans.	c	b	b	a	b	c	d	b	c	c	c	d	b	b	a	a	d	a	c	b
Ques.	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
Ans.	a	c	b	d	a	b	c	b	a	a	c	c	b	c	a	b	b	b	c	c

1. What is amniocentesis?
 - I. A prenatal, foetal determination test.
 - II. A postnatal foetal determination test
 - III. It is based on the chromosomal pattern of the amniotic fluid.
 - IV. It is based on the chromosomal pattern of the chorionic fluid.
 - V. It is based on the chromosomal pattern of the amniotic fluid and the seminal fluid

(a) I, II, III, IV, V (b) I, V (c) I, II, III, IV, V (d) I, IV
2. Reproductive health in society can be improved by-
 - I. Introduction of sex education in schools.
 - II. Increased medical assistance.
 - III. Awareness about contraception and STDs
 - IV. Equal opportunities to male and female child.
 - V. Ban on amniocentesis
 - VI. Encouraging myths and misconceptions

(a) All (b) I, II, IV, V, VI (c) I, II, III, IV, V (d) II, V
3. When were family planning programmes initiated in India?

(a) 1948 (b) 1962 (c) 1959 (d) 1951
4. What is the full form of RCH?

(a) Reproductive and Child Health Care (b) Reproduction, Contraception and Health

(c) Reproduction and Child Health (d) None
5. Select the statement(s) that relate to reproductive health-

(a) Healthy reproductive organs with normal functions (b) Emotional aspects of reproduction

(c) Social aspects of reproduction (d) All
6. Choose the correct statements -

I. According to the WHO, reproductive health is total well-being in the physical, social, emotional and behavioural aspects of reproduction

II. According to the WHO, reproductive health is total well-being in the physical, social and emotional aspects of reproduction

III. A reproductively healthy society has people with physically and functionally normal reproductive organs.

IV. Reproductively healthy societies have abnormal sexual and behavioural interactions

(a) I, II, III (b) II, IV (c) I, III (d) I
7. Where was "Saheli" developed?

(a) Indian Council of Medical Research, New Delhi

(b) Central Drug Research Institute, Lucknow

(c) All India Institute of Medical Sciences, New Delhi

(d) None

8. What is true for IUDs?
- They are self-inserted
 - They are inserted by expert nurses
 - They may be non-medicated IUDs, copper releasing IUDs or hormone releasing IUDs.
 - They are the one of the most widely accepted contraceptives in India.
 - They are inter-uterine devices
- (a) All (b) II, III, IV (c) I, II, III (d) I, II, III, V
9. What is true for "Lactational amenorrhoea"?
- It means absence of menstruation
 - Ovulation does not occur during the lactational period
 - Chances of failure of contraception are almost nil upto six months following parturition
 - Side effects are almost nil
 - Contraceptive efficiency reduces after the period of intense lactation
 - It is a natural method of contraception
 - It increases phagocytosis of sperms
- (a) II, III, IV, V, VI (b) All except VII (c) II, III, IV, V (d) All
10. What is the full form of IUDs?
- (a) Inter Uterine Devices (b) Intra Uterine Diseases (c) Intra Uterine Devices (d) Inter Uterine Diseases
11. What is the method called where the male withdraws his penis just before ejaculation?
- (a) Coitus interruptus (b) Lactational amenorrhoea
- (c) Withdrawal (d) Both a and c
12. Diaphragms, cervical caps and vaults are -
- (a) Reusable (b) Non-reusable (c) Reusable for males only (d) None
13. On which days of the menstrual cycle is ovulation expected?
- (a) 10th - 30th (b) 1st - 10th (c) 10th - 17th (d) 18th - 25th
14. Diaphragms, cervical caps and vaults are-
- (a) For females only (b) For males only (c) For males and females (d) None
15. I. Male condoms are disposable, female condoms are not.
II. Male and female condoms, both, are disposable.
III. Condoms are not disposable in general
IV. Condoms cannot be self - inserted
- What is true from the above statements?
- (a) I, IV (b) III, IV (c) Only II (d) All
16. Nirodh is a popular brand of-
- (a) Contraceptive pill (b) Condom (c) IUD (d) Diaphragm
17. Condoms are barriers that cover-
- (a) Penis in male and ovary in female (b) Penis in male and cervix and vagina in female
- (c) Scrotum in male and cervix and vagina in female (d) Cervix in male and vagina in female

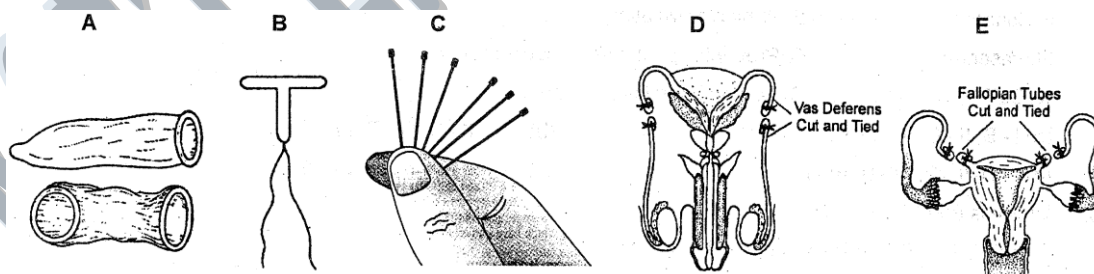
18. Condoms-
- (a) Increase sperm phagocytosis
 - (b) Decrease sperm motility
 - (c) Prevent the ejaculated semen from entering the female reproductive tract
 - (d) Inhibit ovulation
19. Barrier methods are available for -
- (a) Only males
 - (b) Only females
 - (c) Both
 - (d) None
20. What is true of natural methods of contraception?
- (a) They increase phagocytosis of sperms
 - (b) They employ barriers to prevent fertilisation
 - (c) They are natural ways of avoiding chances of fertilisation
 - (d) They are surgical methods and are terminal methods
21. What is true for an ideal contraceptive?
- I. It should be user-friendly
 - II. It should be easily available
 - III. It should be ineffective and reversible with least side effects
 - IV. It should be effective and reversible with least side effects.
 - V. It should interfere with the sexual act of the user
- (a) All
 - (b) I, II, III
 - (c) I, II, IV
 - (d) I, II, IV, V
22. What is the marriageable age for the females and males in India?
- (a) 18,18
 - (b) 18,25
 - (c) 21,18
 - (d) 18,21
23. What does the slogan "Hum Do Hamare Do" aim at?
- (a) Raising of the marriageable age
 - (b) Family Planning
 - (c) Immunisation
 - (d) Economic growth
24. What was the growth rate according to the 2001 census report?
- (a) 1.7%
 - (b) 3.6%
 - (c) 5.2%
 - (d) 0.5%
25. I. Rapid decline in death rate.
 II. Rapid increase in MMR and IMR
 III. Rapid decline in MMR and IMR
 IV. Increase in number of people in the reproductive age group
 V. Rapid increase in the death rate
- What are the causes of higher population growth?
- (A) All
 - (b) I, II, IV
 - (c) I, III, IV
 - (d) III, IV, V
26. What is the approximate Indian population according to the recent census (May 2000)?
- (a) About 1 billion
 - (b) About 1 million
 - (c) About 10 billion
 - (d) About 15 million
27. What is the approximate world population according to the recent census? (May 2000)
- (a) About 6 billion
 - (b) About 60 billion
 - (c) About 16 billion
 - (d) About 6 million

28. STDs lead to-
- Itching, fluid discharge, slight pain, swellings, etc.
 - Pelvic Inflammatory Diseases (PID), ectopic pregnancies, still births, infertility, abortions, etc.
 - Both a and b
 - None
29. Which of the sets of diseases are completely curable if detected early?
- Hepatitis - B, Gonorrhoea, Syphilis
 - Genital herpes, Chlamydia, Syphilis
 - HIV Infections, Chlamydia, Gonorrhoea
 - Chlamydia, Genital warts, Syphilis
30. Choose the correct option -
- RTI - Reproductive Tract Infections
 - VD-Venereal Diseases
 - STD - Sexually Transmitted Diseases
 - IVF - Intra Vaginal Transfer
- All
 - I, II, III
 - II, III
 - I, II
31. MTP is practised mainly to -
- Get rid of unwanted female child legally
 - Get rid of unwanted pregnancies due to failure of contraception or rapes
 - Both a and b
 - Decrease population size
32. MTPs are considered relatively safe during the _____ trimester; _____ trimester abortions are much riskier.
- First, second
 - Second, first
 - Third, first
 - Third, second
33. MTP was legalised in India in -
- 1971
 - 1951
 - 1981
 - 1923
34. MTP is -
- Medical Termination of Pregnancy
 - Also called induced abortion
 - Both a and b
 - Aimed at decreasing population size
35. Sterilisation in males is _____ and in females is _____
- Vasectomy, Tubectomy
 - Tubectomy, Vasectomy
 - Vasectomy, Vasectomy
 - Tubectomy, Tubectomy
36. What is true for surgical methods?
- Also called sterilisation
 - Terminal method of contraception
 - Block gamete transport
 - Called vasectomy in females and tubectomy in males
 - High reversibility and contraceptive efficiency
 - High contraceptive efficiency
- I, II, III, VI
 - I, II, III, V
 - I, II, III, IV, VI
 - I, II, III, VI
37. Pills, implants and IUDs are very effective if taken within _____
- 5 days
 - 72 hours
 - 30 days
 - 15 days

38. What is true about "Saheli"?
- Developed at the CDRI, Lucknow
 - Contains a steroidal preparation
 - "Once-a-week" pill
 - Many side effects
 - High contraceptive value
 - Very few side effects
 - Low contraceptive value
- (a) I, II, III, V, VI (b) I, III, V, VI (c) I, II, III, IV, V (d) I, III, IV, V
39. Pills -
- Inhibit ovulation and implantation
 - Alter the quantity of cervical mucus to prevent or retard the entry of sperms
 - Prevent the ejaculated semen from entering the female vagina
 - Inhibit spermatogenesis
- (a) All (b) I, II, III (c) I, II (d) I, II, IV
40. Oral contraceptive pills are composed of -
- (a) Progestogens only (b) Progestogen - estrogen combinations
(c) Progestogens - testosterone combinations (d) a or b
41. **Column I** **Column II**
- | | |
|----------------------------|------------------|
| I. Non-medicated IUDs | A. Lippes loop |
| II. Hormone releasing IUDs | B. Multiload 375 |
| III. Copper releasing IUDs | C. CuT |
| | D. Cu7 |
| | E. LNG-20 |
| | F. Progestasert |
- The correct match is -
- (a) I - A; II - B, F; III - C, D, E (b) I - A; II - E, F; III - B, C, D
(c) I - B; II - E, F; III - A, C, D (d) I - B; II - A, F; III - C, D, E
42. Birth rate = B
Death Rate = D
Emigration = E
Immigration = I
- Column I** **Column II**
- | | |
|-----------------------------|---------------------|
| A. Population is stable | I. $B + I > D + E$ |
| B. Population is increasing | II. $B + I = D + E$ |
| C. Population is decreasing | III. $B + D > E$ |
| | IV. $B + E > D + I$ |
- (a) A-II, B-I, C-III (b) A- II, B - IV, C - III
(c) A- III, B - IV, C - I (d) A- I, B - II, C - IV

43. **Column I** **Column II**
- | | |
|------------------------|----------------------|
| I. Natural methods 1 | A. Coitus Interrupts |
| II. IUDs | B. LNG-20 |
| III. Barrier methods | C. Diaphragms |
| IV. Surgical methods | D. Multiload 375 |
| V. Oral contraceptives | E. Saheli |
| | F. Nirodh |
| | G. Sterilization |
| | H. Vasectomy |
| | I. CuT |
- (a) I-A; II-D, I; III-C.F; IV-G.H; V-E, B
 (b) I -A; II - B, D, I; III - C, F; IV - G, H; V - E
 (c) I-A; II-B, E, I; III-C, F; IV-G, H; V-D
 (d) I -A; II -1; III - C, F; IV - G, H; V - B, D, E
44. Surgical methods of contraception prevent –
 (a) Gamete formation (b) Gamete motility (c) Both a and b (d) Spermatogenesis only
45. State which is true -
 I. Abortions could happen spontaneously too.
 II. Infertility is the inability to produce viable offsprings due to defects in the female partner only
 III. Complete lactation could help in contraception
 IV. Creating awareness can help create a reproductively healthy society
 (a) I, III, IV (b) I, II, III (c) II, III (d) III, IV

46.

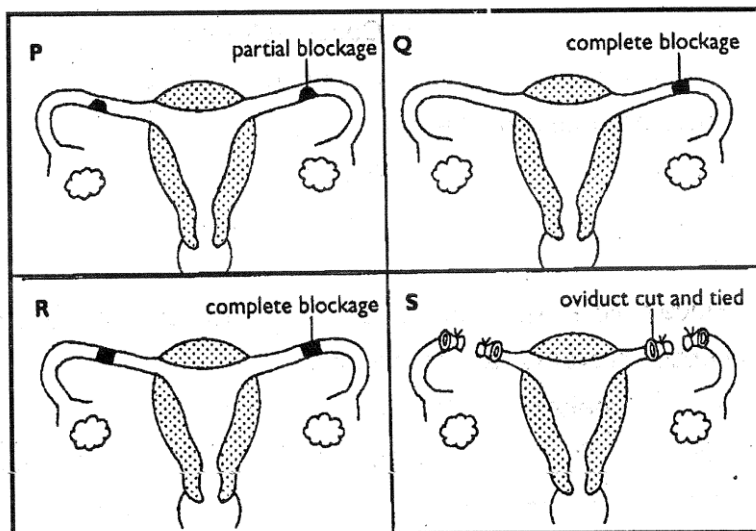


- I. Tubectomy
 II. Vasectomy
 III. Implants
 IV. Condoms
 V. Copper!
 VI. Cervical caps
- (a) A-VI, B-V, C-III, D-II, E-I
 (b) A-III, B-V, C-IV, D-I, E-II
 (c) A-IV, B-V, C-III, D-II, E-I
 (d) A-VI, B-V, C-IV, D-I, E-II

47. Match the ARTs with their description -
- Collected gametes are made to form the zygote in the laboratory.
 - Zygote or early embryo with upto 8 blastomeres is transferred into the oviduct.
 - Zygote with more than 8 blastomeres is transferred into the uterus.
 - Fusion of gametes within the female.
 - Transfer of ovum from a donor to the oviduct of the recipient.
 - Sperm is injected into the ovum *in-vitro*.
- A. GIFT B. ZIFT C. AI G. IUI D. ICSI
 E. IUT F. IVF H. In-vivo fertilisation
- (a) I - G, II - B, III - F, IV - H, V - A, VI - D (b) I - F, II - B, III - A, IV - H, V - A, VI - G
 (c) I - F, II - B, III - E, IV - H, V - A, VI - D (d) I - G, II - B, III - F, IV - H, V - C, VI - E
48. **Column I** **Column II**
- A. ZIFT I. Zygote Inter-Fallopian Transfer
 B. ICSI II. Gamete Intra Fallopian Transfer
 C. GIFT III. Zygote Intra Fallopian Transfer
 IV. Inter Cytoplasmic Sperm Injection
 V. Intra Cytoplasmic Sperm Injection
- (a) I - A, II - C, V - B (b) II - C, III - A, V - B (c) I - A, II - C, IV - B (d) II - C, III - A, IV - B
49. To avoid transmission of STDs -
- Avoid sex with multiple partners.
 - Always have unprotected sex.
 - Use condoms during coitus.
 - Avoid sex with unknown partners
 - Avoid sharing of needles
- (a) All (b) I, III, IV, V (c) I, II, III (d) I, II, IV
50. People especially vulnerable to STDs are in the age group -
- (a) 15-24 (b) 25-40 (c) 5-12 (d) 40-60
51. Natural methods of birth control include?
- (a) abstinence (b) coitus interruptus
 (c) lactational amenorrhoea (d) All of these
52. Using which contraceptive also provides protection from contracting STDs and AIDs?
- (a) Diaphragms (b) Spermicidal foams (c) Condoms (d) lactational amenorrhoea
53. Birth control pills check ovulation in female by inhibiting the secretion of -
- (a) follicle stimulating hormone (b) luteinizing hormone
 (c) Both (d) None
54. Which of the following is/are related to STDs?
- (a) infertility (b) still birth
 (c) pelvic inflammatory disease (d) All of the above

55. What is false for ZIFT?
- (a) ZIFT - Zygote Intra Fallopian Transfer
 - (b) It follows IVF
 - (c) Zygote or early embryo
 - (d) Embryos with more than 8 blastomeres are transferred to the uterus
56. Gamete Intra-fallopian transfer is -
- (a) injecting embryo into oviduct
 - (b) an ART
 - (c) injecting egg and sperm into oviduct in case of infertility
 - (d) Both b and c
57. Which of the following diseases is/are not completely curable?
- (a) genital herpes
 - (b) HIV infection
 - (c) Both a and b
 - (d) syphilis
58. Which of the following is/are correct?
- (a) pill prevents ovulation
 - (b) vasectomy causes semen having no sperms
 - (c) copper-T prevents implantation
 - (d) All of the above
59. What is false for GIFT?
- (a) It is Gamete Intra-Fallopian Transfer
 - (b) Ovum from a donor is transferred into the oviduct of the recipient
 - (c) Zygote from a donor is transferred into the oviduct of the recipient
 - (d) The recipient cannot produce ovum
60. Cu released by CuTs plays a role in -
- (a) Increasing phagocytosis of sperms
 - (b) Suppressing sperm motility
 - (c) Suppressing fertilising capacity of sperms
 - (d) Both b and c
61. "Test tube" baby refers to -
- (a) A baby born in test tube
 - (b) An ovum made to fertilise in-vitro and then implanted in the uterus
 - (c) A method of tissue culture
 - (d) None
62. Which is true?
- I. Generally MTP is safe during the first trimester
 - II. Chances of contraception are nil until the mother breast-feeds the infant upto 2 years
 - III. IUDs are very effective contraceptives
 - IV. Pills may be taken upto one week after coitus to prevent conception
- (a) I, II
 - (b) II, III
 - (c) III, IV
 - (d) I, III

63. **Column I**
- I. Pill
II. Condom
III. Vasectomy
IV. CuT
- (a) I - B, II - C, III - D, IV - A
(c) I-D, II-C, III-B, IV-A
- Column II**
- A. Prevents implantation
B. Prevents ovulation
C. Prevents sperms from reaching cervix
D. Semen contains no sperms
- (b) I -A, II - B, III - D, IV - A
(d) I-C, II-D, III-A, IV-B
64. Which one of the following is the most widely accepted method of contraception in India, as at present?
- (a) IUDs' (Intra uterine devices)
(c) Tubectomy
- (b) Cervical caps
(d) Diaphragms
65. The accompanying diagram shows the uterine tubes of four women (P, Q, R and S).



In which two women is fertilization impossible at present?

- (a) P and Q (b) Q and R (c) R and S (d) S and P
66. Select the option which correctly fills up the blanks in the following statements.

Statements:

- A Baby produced by conceiving in a culture dish and nursing in the uterus is called a _____.
B. Family planning programmes were initiated in _____.
C. Permanent methods of birth control are _____ in male and _____ in females.
D. Embryo transplants are more useful in _____ than in _____.

Options:

- (a) A - test tube baby; B -1951; C - Vasectomy, tubectomy; D - Animals, humans
(b) A- test tube baby; B -1951; C - Tubectomy, Vasectomy; D -Animals, humans
(c) A - test tube baby; B -1951; C - Vasectomy, tubectomy; D - Humans, animals
(d) A- test tube baby; B -1951; C - Tubectomy, Vasectomy; D - Humans, animals
67. Identify the true statements from the below statements -
- I. There are many side effects of tubectomy and vasectomy.
II. Purpose of tubectomy is to prevent egg formation.
III. The most important component of the oral contraceptive pills is progesterone.
IV. Contraceptive oral pills help in birth control by preventing ovulation.
V. Genital warts is a sexually transmitted disease caused by herpes virus.
VI. In India, there is rapid decline in infant mortality rate and MMR.
- (a) I, II and III (b) I, II and V (c) III, IV and VI (d) IV, V and VI

68. Match the Column A with the Column B –

Column A

Column B

- | | |
|-------------------|------------------------------|
| I. ILTT | A. Copper! |
| II. Birth control | B. Agent to kill spermatozoa |
| III. Spermicides | C. VDRL |
| IV. STD | D. To help infertile couple |

(a) I - D, II - C, III - A, IV - B (b) I - D, II - C, -B.IV-A (c) I-B, II-D, III-A, IV-C (d) I - D, II-A, III - B, IV-C

69. Identify the false statements from the statements -

- I. Birth control pills are likely to cause cardiovascular problems.
- II. A woman who substitutes or takes the place of the real mother to nurse the embryo is called surrogate mother.
- III. Numerous children have been produced by invitro fertilization but with some abnormal ties.
- IV. Woman plays a key role in the continuity of the family and human species.
- V. Foetal sex determination test should not be banned.

(a) I and II (b) II and IV (c) III and V (d) None

70. Select the option which correctly fills up the blanks in the following statements.

Statements:

- A. Destruction of embryo or foetus in the uterus is called _____.
- B. Government of India legislated MTP in the year _____.
- C. Natural family planning method is also called _____.
- D. _____ is a method in which the male partner withdraws his penis from vagina just before ejaculation.
- E. _____ is the copper releasing and _____ is a hormone releasing intra uterine devices.

Options:

- (a) A - Foeticide, B -1961, C - Rhythm method, D - Coitus interruptus, E - Multiload 375, LNG-20 -
- (b) A - Foeticide, B -1971, C - Rhythm method, D - Coitus interruptus, E - Multiload 375, LNG-20
- (c) A- Foeticide, B -1965, C - Rhythm method, D - Coitus interruptus, E - Multiload 375, LNG-20
- (d) A- Foeticide, B -1982, C - Rhythm method, D - Coitus interruptus, E - Multiload 375, LNG-20

71. Artificial insemination means

- (a) Transfer of sperms of husband to a test tube containing ova
- (b) Artificial introduction of sperms of a healthy donor into the vagina
- (c) Introduction of sperms of healthy donor directly into the ovary
- (d) Transfer of sperms of a healthy donor to a test tube containing ova

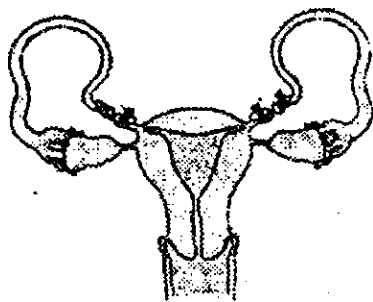
72. Which of the following cannot be detected in a developing foetus by amniocentesis ?

- | | |
|-----------------------|--------------------------|
| (a) Sex of the foetus | (b) Down syndrome |
| (c) Jaundice | (d) Klinefelter syndrome |

73. One of the legal methods of birth control is-

- (a) By abstaining from coitus from day 10 to 17 of the menstrual cycle
- (b) By having coitus at the time of day break
- (c) By a premature ejaculation during coitus
- (d) Abortion by taking an appropriate medicine

74. The test-tube Baby Programme employs which one of the following techniques
- (a) Intra cytoplasmic sperm injection (ICSI) (b) Intra uterine insemination (IUI)
- (c) Gamete intra fallopian transfer (GIET) (d) Zygote intra fallopian transfer (ZIFT)
75. What is the figure given below showing in particular?



- (a) Ovarian cancer (b) Uterine cancer (c) Tubectomy (d) Vasectomy
76. It is a disease which mainly affects mucous membrane of urinogenital tract. In males, burning feeling on passing urine, after a yellow discharge occurs, that is accompanied by fever, headache and feeling of illness. Its name is
- (a) syphilis (b) gonorrhoea (c) AIDS (d) none of these.
77. Which of the following is the method of traditional contraception ?
- (a) Implantation (b) Lactational amenorrhoea
- (c) Condoms (d) Sterilization
78. For delaying pregnancy or spacing children the ideal contraceptive is
- (a) Vasectomy (b) Tubectomy (c) IUD (d) Oral contraceptive
79. The diaphragm, cervical cap and vaults are
- (a) Disposable contraceptive devices (b) Reusable contraceptives
- (c) IUDs (d) implants
80. Mark the incorrect statement
- (a) According to 2001 census our population growth rate was 1.7%
- (b) Marriageable age for male and female is respectively 18 and 21 years
- (c) An ideal contraceptive should be reversible
- (d) The problem of infertility in India lies most often in female partner
81. India's population crossed 1 billion in
- (a) May 2001 (b) Dec. 1999 (c) May 2000 (d) Dec. 1991
82. Following is a weekly oral contraceptive
- (a) Mala D (b) i pill (c) Saheli (d) All of these
83. The family planning programme in India were initiated in
- (a) 1951 (b) 1961 (c) 1971 (d) 1981
84. Read the following 4-statements and mark the option that has both correct statements
- A. MTP was legalized in 1971
- B. Inability to conceive or produce children even after 2 years of unprotected sexual cohabitation is called infertility
- C. Surgical method of contraception prevents gamete formation
- D. MTPs are relatively safe up to 12 weeks of pregnancy
- (a) A, B and D (b) B, C and D (c) C and D (d) A and C

85. Tying up or removing a small part of fallopian duct is called
 (a) Vasectomy (b) Ductus arteriosus (c) Archidectomy (d) Tubectomy
86. Progestasert and LNG-20 are
 (a) Implants (b) Copper releasing IUDs
 (c) Non-medicated IUDs (d) Hormone releasing IUDs
87. The copper ions of IUDs
 (a) Suppress the motility and fertilization capacity of sperms
 (b) Make the uterus unsuitable for implantation
 (c) Increase phagocytosis of sperms
 (d) Make cervix hostile to sperms
88. Present increase in India's population has not been due to decline in
 (a) Infant mortality rate (b) Number of people reaching reproductive age
 (c) Death rate (d) Maternal mortality rate
89. For imposing a check on increasing female foeticides
 (a) MTP has been legalized (b) Tubectomy is being practiced
 (c) Amniocentesis has been banned (d) All of these
90. RCH stands for
 (a) Routine check-up of health (b) Reproduction cum hygiene
 (c) Reversible contraceptive hazards (d) Reproduction and child health care

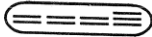
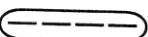
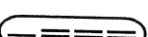

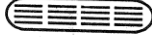
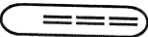
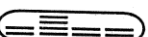
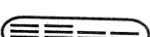
ANSWER KEY

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21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
c	d	b	a	c	a	a	c	d	b	b	a	a	c	a	a	b	b	c	d
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
b	a	b	b	a	c	c	b	b	a	d	c	c	d	d	d	c	d	c	d
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
b	d	a	a	c	a	c	d	c	b	b	c	d	d	c	b	b	c	b	d
81	82	83	84	85	86	87	88	89	90										
c	c	a	a	d	d	a	b	c	d										

1. Mendel's monohybrid ratio is-
 (a) 1:2 (b) 3:1 (c) 9:3:3: 1 (d) 9:7
2. Who is considered as father of genetics?
 (a) Hugode Vries (b) Morgan (c) Mendel (d) Darwin
3. Pleiotropic gene has -
 (a) single genotype (b) multiple genotype (c) multiple phenotype (d) single phenotype
4. How many contrasting characters were selected by Mendel?
 (a) One (b) Two (c) Three (d) Seven
5. A cross between F_1 hybrid and a recessive parent ($Tt \times tt$) gives a ratio of -
 (a) 1:1 (b) 2:1 (c) 3: 1 (d) 4:1
6. An allele is dominant, if it is expressed in -
 (a) second generation
 (b) homozygous combination
 (c) heterozygous combination
 (d) both homozygous and heterozygous conditions
7. A tall red-flowered pea plant after crossing with a dwarf white-flowered plant yields only tall red-flowered plants. A test cross shall give a ratio of
 (a) 1 : 1 (b) 3 : 1 (c) 1 : 2 : 4 : 6 : 4 : 2 : 1 (d) 1 : 1 : 1 : 1
8. An organism with two identical alleles is said to be -
 (a) hybrid (b) homozygous (c) heterozygous (d) dominant
9. A test cross enables one to
 (a) determine the viability of cross
 (b) distinguish between homozygous dominant and heterozygous dominant
 (c) determine whether two species can interbreed
 (d) determine the similarities in the DNA of two species
10. In sweet pea, the epistatic interaction between the genes for purple and white colour produced the two colours in the ratio-
 (a) 3:1 (b) 8:8 (c) 9:3:3: 1 (d) 9:7
11. A cross between parents with $AaBB$ and $aaBB$ genotype will form -
 (a) all $AaBB$ (b) 1 $AaBB$: 3 $aaBB$ (c) 1 $AaBB$: 1 $aaBB$ (d) 3 $AaBB$: 1 $aaBB$
12. How many types of gametes will be produced by individuals of $AABbcc$ genotype ?
 (a) Two (b) Four (c) Six (d) Nine
13. ABO blood groups is determined by
 (a) three recessive alleles (b) three codominant alleles
 (c) three alleles, two dominant and one recessive (d) three alleles, two recessive and one dominant
14. Mendel's dihybrid ratio is
 (a) 15:1 (b) 9:3:3:1 (c) 1 : 2 : 1 (d) 9 : 6 : 1

15. The ratio 9 : 7 is produced due to -
 (a) complementary genes (b) supplementary genes
 (c) lethal genes (d) epistatic genes
16. When a gene pair hides the effect of another, the phenomenon is called -
 (a) mutation (b) dominance (c) epistasis (d) none of these
17. Mendel did not propose the theory of -
 (a) dominance (b) incomplete dominance
 (c) segregation (d) independent assortment
18. A cross between hybrid and recessive parent is
 (a) back cross (b) test cross (c) monohybrid cross (d) dihybrid cross
19. Inheritance of skin colour in human beings is an example of -
 (a) polygenic inheritance (b) Mendelian inheritance
 (c) monogenic inheritance (d) complementary genes
20. Which of the following proved an exception to Mendel's principles?
 (a) dominance (b) linkage
 (c) independent assortment (d) purity of gametes/segregation
21. In a red and white-flowered cross of *Mirabilis jalapa*, F₂ generation has red, pink and white-flowered plants in the ratio of
 (a) 2 : 1 : 1 (b) 1 : 1 : 2 (c) 1 : 2 : 1 (d) 1:0:1
22. The different forms of a gene are called -
 (a) heterozygotes (b) alleles (c) supplementary genes (d) complementary genes
23. In keeping with the law of independent assortment what is actually assorted?
 (a) Different genes on the same chromosome (b) Centromeres
 (c) Homologous chromosomes (d) Heterologous chromosomes
24. In the AB blood group the two genes are
 (a) codominant (b) corecessive
 (c) incompletely dominant (d) dominant-recessive
25. A woman with one gene for haemophilia and a gene for colour blindness on one of X chromosomes marries a normal man. How will the progeny be?
 (a) All sons and daughters haemophilic and colour blind
 (b) 50% haemophilic colour blind sons and 50% normal sons
 (c) 50% haemophilic daughters and 50% colour blind daughters
 (d) Haemophilic and colour blind daughters
26. Haemophilia is more common in males because it is a-
 (a) recessive trait carried by X chromosome (b) dominant trait carried by X chromosome
 (c) recessive character carried by Y chromosomes (d) dominant character carried by Y chromosome
27. Which one of the following is a sex-linked disease?
 (a) Nightblindness (b) Glaucoma (c) Haemophilia (d) All of these
28. The substance, which causes a definite change in genes is called

(a) toxin (b) alkaloid (c) cytotoxin (d) mutagen

29. Multiple alleles control the character of
 (a) only skin colour (b) only blood groups
 (c) blood groups and skin colour (d) sickle-cell
30. Human skin colour is controlled by .
 (a) a single allele (b) two alleles
 (c) at least three separate genes (d) four alleles
31. A child with mother of A group and father of AB group, will not have the following blood group -
 (a) A (b) B (c) AB (d) O
32. Two dominant independently assorting genes react with each other. They are
 (a) supplementary (b) complementary (c) duplicate (d) collaborative
33. A blue fowl obtained from mating between black and white fowls, is self-crossed. The F₂ ratio is
 (a) 1 black : 2 white : 1 blue (b) 1 black : 2 blue : 1 white
 (c) 2 black : 1 white : 1 blue (d) none of these
34. Crossing over in diploid organisms is responsible for
 (a) linkage between genes (b) segregation of alleles
 (c) dominance of genes (d) recombination of linked genes
35. In Mendel's experiments the alleles were
 (a) codominant (b) corecessive (c) dominant-recessive (d) incompletely dominant
36. A single recessive trait which can express its effect should occur on
 (a) any chromosome (b) any autosome
 (c) X chromosome of male (d) X chromosome of female
37. Chiasma represents the site of
 (a) homologous chromosome (b) crossing over
 (c) pachytene (d) diakinesis
38. A family of five daughters only is expecting sixth issue. The chance of its being son is
 (a) zero (b) 25% (c) 50% (d) 100%
39. Gene located on the same locus but having different expressions are
 (a) oncogenes (b) polygenes (c) multiple alleles (d) codominants
40. Polygenes are
 (a) genes which control continuously variable characters like height, weight, etc.
 (b) multiple copies of a single gene
 (c) always linked genes
 (d) pseudogenes
41. How many types of gametes will be produced by individuals having genotype AaBbCc?
 (a) Two (b) Four (c) Six (d) Eight
42. Assign the correct names from the following list to the figures below.
- A.  B.  C.  D. 
- E.  F.  G.  H. 
- (a) I - A, II - G, III - E, IV - H, V - D, VI - B, VII - F, VIII - C
 (b) I - A, II - G, III - C, IV - B, V - D, VI - H, VII - F, VIII - E
 (c) I - A, II - B, III - C, IV - H, V - D, VI - G, VII - F, VIII - E
 (d) I - A, II - G, III - E, IV - D, V - H, VI - B, VII - C, VIII - F

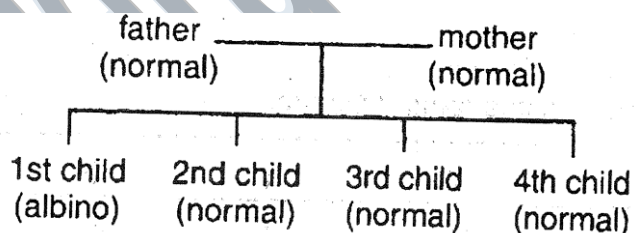
43. The phenotypic and genotypic ratios remain same in F₂ generation in case of
 (a) dihybrid cross (b) supplementary genes (c) incomplete dominance (d) inhibitory genes
44. The test cross of an F₁ individual with genotype (++/ab) produced the following offsprings -
- | | |
|-------|----|
| ++/ab | 10 |
| ab/ab | 10 |
| +a/ab | 40 |
| +b/ab | 40 |
- Based on this data predict the configuration of F₁ heterozygous -
 (a) Cis-configuration (b) Trans-configuration (c) Both the above (d) None of the above
45. Which one of the following is the genotypic ratio in monohybrid cross?
 (a) 9:3:3:1 (b) 1:2:1 (c) 9:7 (d) 3 : 1
46. Which of the following truly represents a heterozygous organism?
 (a) XXyy (b) RRYy (c) xxYY (d) RrYy
47. The meaning of syndrome is related to
 (a) dwarf organ ism (b) diseased condition (c) a group of symptoms (d) viral disease
48. Tritieale has been produced by intergeneric hybridization between
 (a) wheat and rye (b) wheat and rice (c) wheat and *Adgilops* (d) rice and maize
49. If the DMA codons are ATG ATG ATG and a cytosine base is inserted at the beginning, which of the following will result?
 (a) CATGATGATG (b) CAT GAT GAT G (c) CATGATGATG (d) a nonsense mutation
50. Imagine that in maize plant, the factors for controlling seed coat and seed shape are present on the same chromosome very close together. Performing dihybrid experiments with these characters, Mendel would not have been able to arrive at the idea of -
 (a) Dominance (b) Independent assortment
 (c) Incomplete dominance (d) Segregation
51. Substitution of a purine nucleotide by pyrimidine nucleotide is called
 (a) transition (b) transversion (c) inversion (d) transduction
52. Individuals homozygous for cd genes were crossed with wild type (++). The F₁ dihybrid thus produced was test crossed. It produced progeny in the following ratio -
- | | |
|----|-----|
| ++ | 900 |
| cd | 880 |
| +d | 115 |
| +c | 105 |
- What is distance between c
 (a) 5.75 unit (b) 11 units (c) 27 units (d) 88 units
53. The exposure of X-rays enhances the frequency of
 (a) linkage (b) crossing over
 (c) pairing of chromosomes (d) segregation
54. The combined form of coupling and repulsion is -
 (a) crossing over (b) mutation (c) linkage (d) disjunction

55. How many pairs of autosomes are found in human?
 (a) 46 (b) 23 (c) 1 (d) 22
56. Which one of the following is sex-linked disease?
 (a) Haemophilia (b) Down's syndrome (c) Albinism (d) Turner's syndrome
57. What will be the number of linkage groups in a cell having $2n = 20$?
 (a) 15 (b) 40 (c) 10 (d) 4
58. Which of the following genes have similar genotypic effect when present separately but produce different trait after interacting together and give a ratio of 9 : 7 in F_2 generation?
 (a) Complementary genes (b) Jumping genes (c) Duplicate genes (d) House-keeping genes
59. Trisomy has a chromosome complement of -
 (a) $2n-1$ (b) $2n + 2$ (c) $2n + 3$ (d) $2n + 1$
60. Mutations used in agriculture are commonly -
 (a) spontaneous (b) lethal (c) induced (d) recessive and lethal
61. Harmful mutations does not get eliminated from gene pool because
 (a) they have survival value
 (b) they are recessive and carried by heterozygous individuals
 (c) they are formed repeatedly
 (d) they show genetic drift
62. Which one of the following would represent *allotetraploid*?
 (a) AAABBB (b) AAAA (c) AA8B (d) BBBB
63. The Klinefelter's syndrome has chromosomal constituent-
 (a) $2A + XX$ (b) $2A + XXY$ (c) $2A + Y$ (d) $2A - XY$
64. In which stage crossing over takes place?
 (a) Leptotene (b) Cytokinesis (c) Pachytene (d) Diakinesis
65. Which of the following statements is true about Mendel?
 (a) His discoveries concerning genetic inheritance were generally accepted by the scientific community when he published them during the mid 19th century.
 (b) He believed that genetic traits of parents will usually blend in their children.
 (c) His ideas about genetics apply equally to plants and animals.
 (d) He discovered linkage
66. If Mendel had studied the 7 traits using a plant with 12 chromosomes instead of 14, in what way his interpretation would have been different?
 (a) He would have discovered crossing over
 (b) He would have discovered blending or incomplete dominance
 (c) He could not have proposed that genes are located on chromosomes
 (d) He would not have discovered the law of independent assortment
67. In mice, black coat colour (allele B) is dominant to brown coat colour (allele b). The offspring of a cross between a black mouse (BB) and a brown mouse were allowed to interbreed. What percentage of the progeny would have black coats?
 (a) 25% (b) 50% (c) 75% (d) 100%

68. In mice, Y is the dominant allele for yellow fur and y is the recessive allele for grey fur. Since Y is lethal when homozygous, the result of cross $Yy \times Yy$ will be
- (a) 3 yellow : 1 grey. (b) 2 yellow : 1 grey.
(c) 1 yellow : 1 grey. (d) 1 yellow : 2 grey.
69. In snapdragon plants, the alleles for red and ivory flower colour show incomplete dominance. When a homozygous red-flowered plant is crossed with a homozygous ivory-flowered plant, all the members of the F_1 generation are found to bear pink flowers. Which of the following would be the outcome of crossing a red-flowered plant with a pink one?
- (a) 1 red : 2 pink : 1 ivory (b) 3 red : 1 ivory (c) 1 red : 1 pink (d) all red
70. In maize plants, two alleles of the gene for seed colour exist. Purple (P) is dominant to yellow (p). A backcross (testcross) was carried out to determine the genotype of a certain purple plant. Which of the following is correct?

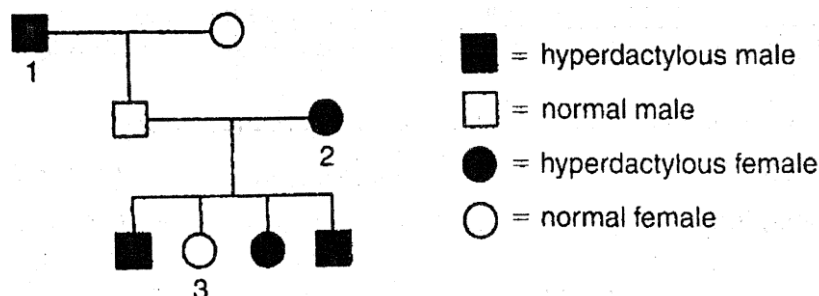
	phenotypic ratio of offspring resulting from backcross	genotype of purple parent
(a)	1 purple : 1 yellow	heterozygous
(b)	3 purple : 1 yellow	homozygous
(c)	1 purple : 1 yellow	homozygous
(d)	all purple	heterozygous

71. Refer to the following family tree.



If A = normal allele and a = albino allele, the genotypes of these parents are

- father mother
- (a) Aa Aa
(b) AA AA
(c) AA Aa
(d) Aa AA
72. In humans, the condition hyperdactyly (the possession of twelve fingers) is determined by a dominant allele (H) and the normal condition by the recessive allele (h). The following diagram shows a family tree in which some members of the family are hyperdactylous.



The genotypes of persons 1, 2 and 3 in this family tree are –

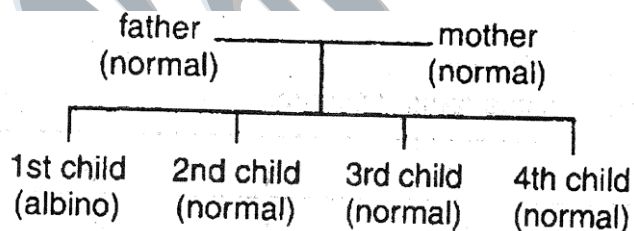
	1	2	3
(a)	HH	Hh	hh
(b)	HH	HH	hh
(c)	Hh	HH	Hh
(d)	Hh	Hh	hh

73. A certain type of anaemia exists in two forms, major (severe) and minor (mild). The following table relates the genotypes of both types of sufferer to that of a normal person.

person	genotype
non sufferer	NN
minor sufferer	NA
major sufferer	AA

If NA marries NA, the chance of each of their children being mildly affected is -

- (a) 1 in 1 (b) 1 in 2. (c) 1 in 3. (d) 1 in 4.
74. Refer to the following family



The chance of this couple's fifth child being an albino is

- (a) 1 in 2. (b) 1 in 3. (c) 1 in 4. (d) 1 in 5.
75. In humans, the gene for red blood corpuscle shape (alleles elliptical E and normal) is linked to gene for Rhesus blood (alleles Rhesus positive R and Rhesus negative)
A person with alleles E and R on one chromosome and e and r on its homologous partner will defined produce gametes with the genotypes
(a) EeandRr. (b) Eeander (c) ERandRr. (d) ERander.
76. In *Drosophila*, long wing (L) is dominant to dumpy wing (l) and grey body (G) is dominant to ebony body (g). The two genes involved are not on the same chromosome.
A true-breeding long-winged, ebony-bodied fly is crossed with a true-breeding dumpy-winged, grey-bodied fly.
The genotype of the F₁ generation will be
(a) LiGg (b) LLGg (c) LLGG (d) LiGG
77. In a certain species of sweet pea plant, flowers are either purple or white. Colour is determined by two unlinked, genes. The alleles of the first gene are X and x; those of the second gene are Y and y.
In order to bear purple flowers, a plant must possess at least one X and one Y allele. Those genotypes which fail to do so, result in the formation of white flowers.
If two purple-flowered plants of genotype XxYy are crossed then the expected phenotypic ratio of offspring would be

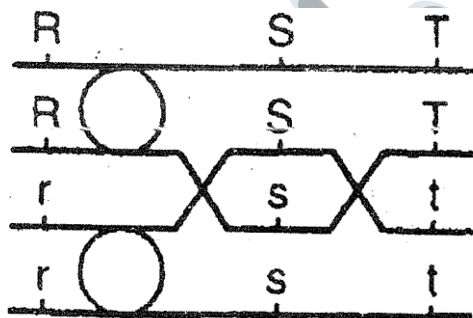
- (a) 12 purple 4 white (b) 9 purple 7 white (c) 10 purple 6 white (d) 8 purple 8 white

78. In a certain plant, yellow fruit colour (Y) is dominant to green (y) and round shape (R) is dominant to oval (r). The two genes involved are located on different chromosomes.

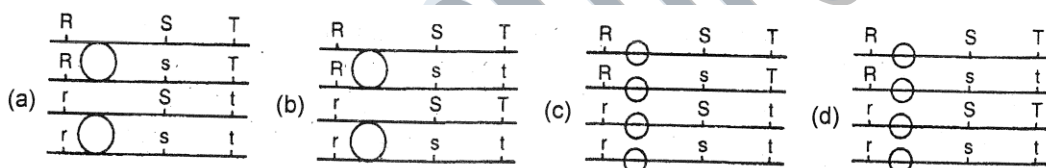
Which of the above will result when plant YyRr is backcrossed (testcrossed) with the double recessive parent?

- (a) 9:3:3:1 ratio of phenotypes only (b) 9:3:3:1 ratio of genotypes only
(c) 1:1:1:1 ratio of phenotypes only (d) 1:1:1:1 ratio of phenotypes and genotypes

79. The diagram opposite shows a homologous (bivalent) pair of chromosomes during meiosis.



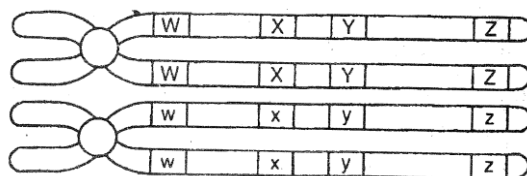
Which of the following correctly represents the final products of second meiotic division ?



80. In fruit flies, long wing is dominant to vestigial wing. When heterozygous long-winged flies were crossed with vestigial-winged flies, 192 offspring were produced. Of these 101 had long wings and 91 had vestigial wings. If an exact Mendelian ratio had been obtained, then the number of each phenotype would have been

	long-winged	vestigial-winged
(a)	64	128
(b)	96	96
(c)	128	64
(d)	192	0

81. The diagram opposite shows a pair of homologous chromosomes during meiosis.



Most crossing over will occur between genes

- (a) W and X (b) X and Y (c) Y and Z (d) W and Z

82. In snapdragon plants, broad leaf is compie⁴ dominant to narrow leaf whereas red flower colour is incompletely dominant to ivory. (The genes for leaf width and flower colour are not linked.)

If a plant which is heterozygous for both genes is crossed with a true-breeding broad-leaved red-flowered plant, then the expected proportion of broad-leaved plants with pink flowers amongst the offspring would be

(a) 1 in 4.

(b) 2 in 4.

(c) 3 in 4.

(d) 4 in 4.

83. In a certain plant, yellow fruit colour (Y) is dominant to green (y) and round shape (R) is dominant to oval (r). The two genes involved are located on different chromosomes.

Which of the above will result when plant YyRr is self-pollinated?

(a) 9:3:3:1 ratio of phenotypes only

(b) 9:3:3:1 ratio of genotypes only

(c) 1:1:1:1 ratio of phenotypes only

(d) 1:1:1:1 ratio of phenotypes and genotypes

84. **Column A**

I. Nonparental gene combination

II. Nonsister chromatids

III. Sex chromosomes

IV. Haemophilia

The correct match is

(a) I-B, II-D, III-A, IV-C

(c) I-B, II-D, III-C, IV-A

Column B

A. Crossing over

B. X and Y

C. Sex-linked disease

D. Recombination

(b) I-D, II-A, III-B, IV-C

(d) I-B, II-A, III-D, IV-C

85. The punnett square shown below represents the pattern of inheritance in dihybrid cross when yellow (Y) is dominant over white (y) and round (R) is dominant over wrinkled (r) seeds

YR	Yr	yR	yr
F	J	N	R
G	K	O	S
H	L	P	T
I	M	Q	U

A plant of type 'H' will produce seeds with the genotype identical to seeds produced by the plants of-

(a) Type M

(b) Type J

(c) Type P

(d) Type N

86. **Column A**

I. Chromosomal aberration

II. Down's syndrome

III. Klinefelter's syndrome

IV. Turner's syndrome

The correct match is

(a) I-B, II-D, III-A, IV-C

(c) I-B, II-C, III-A, IV-D

Column B

A. An additional sex chromosome

B. Inversion

C. Presence of an extra chromosome

D. Absence of sex chromosome

(b) I-B, II-D, III-C, IV-A

(d) I-C, II-D, III-A, IV-B

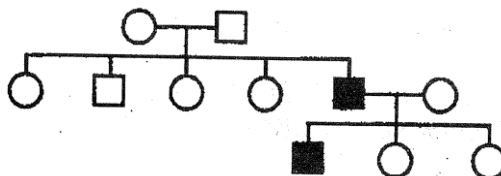
87. In humans, the gene for red blood corpuscle shape (alleles elliptical E and normal e) is linked to the gene for Rhesus blood (alleles Rhesus positive R and Rhesus negative r).
If crossing over occurs between these two genes, then the two additional types of gametes that could result are
(a) RE and re. (b) EE and rr. (c) Er and eR. (d) ee and RR.
88. In a certain species of animal, genes T, U, V and W occur on the same chromosome. The following table gives their cross-over values (COVs).

linked gene pair	cov
T and U	25
T and V	5
V and U	30
U and W	10
V and W	20

Which of the following represents the correct order of the genes on the chromosome?

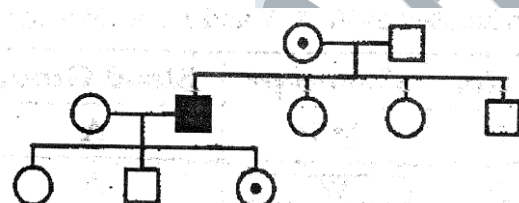
- (a) VT.W, U BT,W, U, V (c) T, V,W, U (d) V, W, T, U

89. In the following pedigree chart, the mutant trait is shaded black. The gene responsible for the trait is



- (a) dominant and sex linked (b) dominant but autosomal
(c) recessive and sex linked (d) recessive and autosomal.

90. Predict from the following chart



- (a) character is dominant and carried by X chromosomes
(b) character is carried by Y chromosomes
(c) character is sex linked recessive
(d) character is recessive autosomal.

91. **Column A**

- I. Autosomal linked recessive trait
II. Sex linked recessive disease
III. Metabolic error linked to autosomal recessive trait
IV. Additional 21 st chromosome

The correct match is

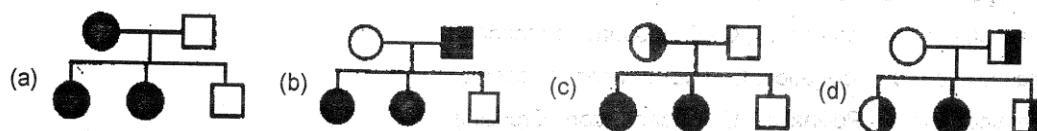
- (a) I - B, II - A, III - D, IV - C
(c) I - D, II - C, III - B, IV - A

Column B

- A. Down's syndrome
B. Phenylketonuria
C. Haemophilia
D. Sickle Cell Anaemia

- (b) I - D, II -A, III - B, IV - C
(d) I - C, II - D, III - A, IV - B

92. Wife is PTC nontaster and husband is PTC taster. Their son is taster but daughters are nontasters. This is not a sex linked trait. Which pedigree is correct?



93. **Column A**

- I. Sickle-cell anaemia
II. Phenylketonuria
III. Cystic fibrosis
IV. Huntington's disease
V. Colour blindness
The correct match is

Column B

- A. 7th chromosome
B. 4th chromosome
C. 11th chromosome
D. X-chromosome
E. 12th chromosome

- (a) I-B, II-A, III-D, IV-C, V-D
(c) I-D, II-B, III-A, IV-C, V-D

- (b)
(d)

94. Observe the sex determination in the following

I. Human males = XY

II. Female hen = ZW

III. Male Drosophila = XY

IV. Male grasshopper = XO

V. Male birds = ZZ

Male heterogamety = A

Female heterogamety = B

Male homogamety = C

Which of the following combination is correct -

- | | A | B | C |
|-----|----------|----|-----|
| (a) | 1,111,1V | II | V |
| (b) | 11,1V | I | III |
| (c) | 111,1V | II | I |
| (d) | 11,1V | I | II |

95. The following table shows the genotypes for ABO blood grouping and their phenotypes. In which one of the four options the components of reaction labelled as W, X, Y and Z are identified correctly?

S. No.	Genotype	Blood Group
1	$I^A I^A$	A
2	W	A
3	$I^B I^B$	B
4	X	B
5	$I^A I^B$	Y
6	Z	O

- | | W | X | Y | Z |
|-----|---------|---------|----|----|
| (a) | $I^A i$ | $I^B i$ | AB | ii |
| (b) | $I^B i$ | $I^A i$ | B | ii |
| (c) | $I^B i$ | $I^B i$ | A | ii |
| (d) | $I^A i$ | $I^A i$ | O | ii |

96. **Column A**

- I. Turner syndrome
II. Linkage
III. Y-chromosome
IV. Down's syndrome

Column B

- A. Trisomy
B. AA + XO
C. Morgan
D. TDF

The correct match is.

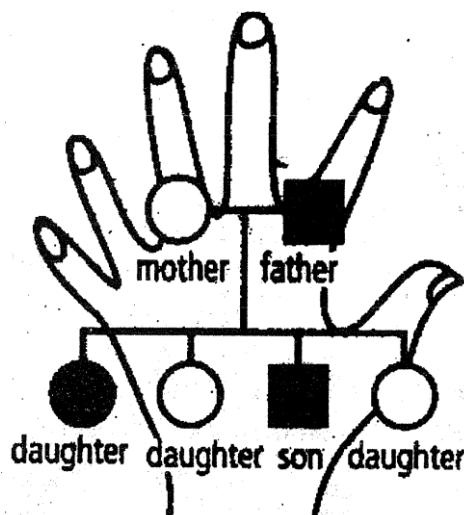
(a) I-B, II-A, III-D, IV-C

(b) I-D, II-A, III-B, IV-C

(c) I-D, II-B, III-A, IV-C

(d) I-B, II-C, III-D, IV-A

97. In the given figure of human hand pedigree analysis is given



In the above pedigree which character is represented, and what is the probability of disease occurrence in fifth child?

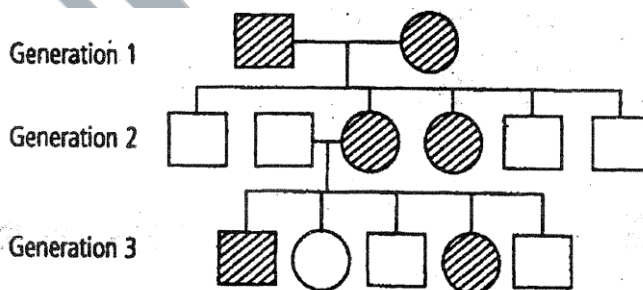
(a) Polydactyly (autosomal dominant disorder), 50%

(b) Polydactyly (autosomal recessive disorder), 50%

(c) Pctydacty'y (X-linkcd dom'n'aT»td'scrdor), 50%

(d) Po'ydacty'y (X-Knked -ecess'v'e 6'scrder), 50%

98. . Given below is a pedigree chart showing the inheritance of a certain sex-linked trait in humans.



Key :



Unaffected male



Unaffected male



Unaffected male



Unaffected male

The trait traced in the above pedigree chart is

(a) dominant X-linked

(b) recessive X-linked

(c) dominant Y-linked

(d) recessive Y-linked 14.

99. **Column A**

I. ABO blood groups

II. Law of segregation

III. Law of Independent assortment

IV. Gene mutation

Column B

A. Dihybrid cross

B. Monohybrid cross

C. Base pairs substitution

D. Multiple allelism

The correct match is

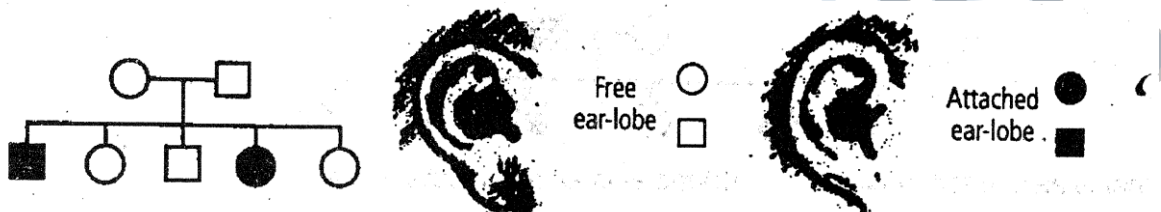
(a) I-B, II- A, III-D, IV-C

(b) I-D, II- A, III-B, IV-C

(c) I-D, II-B, III-A, IV-C

(d) I-B, II- C, III-D, IV-A

100. Given below is a pedigree chart of a family with five children. It shows the inheritance of attached, ear-lobes as opposed to the free ones. The squares represent the male and circles the female individuals.



Which one of the following conclusions drawn is correct?

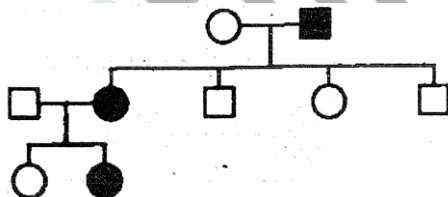
(a) the trait is Y-linked

(b) the parents are heterozygous

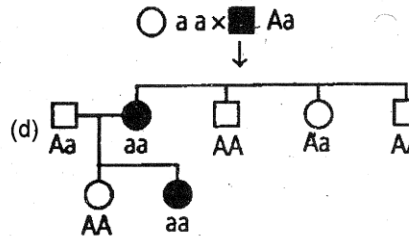
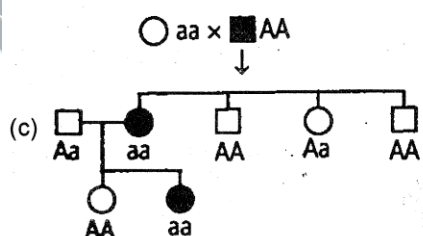
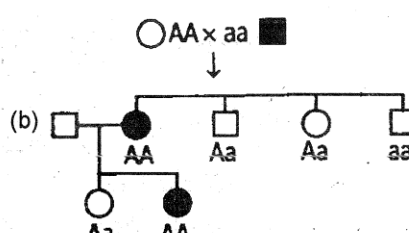
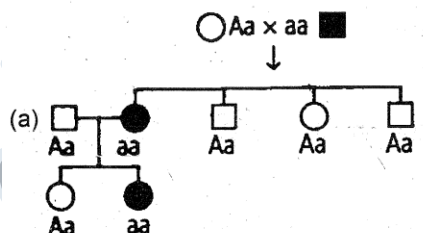
(c) the parents are homozygous recessive

(d) the parents are homozygous dominant.

101. The daughter was married to a normal person and their daughter had the trait.



It can be explained as



102. **Column A**

I. Nondisjunction

II. Mendel

III. Morgan

IV. Set of chromosomes

The correct match is

(a) I-B, II- A, III-D, IV-C

Column B

A. Pea

B. *Drosophila*

C. Genome

D. Aneuploidy

(b) I-D, II-A, III-B, IV-C

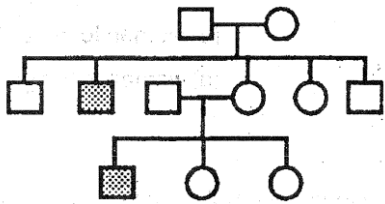
(c) I-D, II-B, III-A, IV-C

(d) I-B, II-C, III-D, IV-A

103. This question refers to eye colour in the fruit fly. In this sex-linked trait, the allele for red eye is dominant to that for white eye. If a heterozygous red-eyed female is crossed with a white-eyed male, what percentage of the female offspring will be white-eyed?

(a) 0% (b) 25% (c) 50% (d) 100%

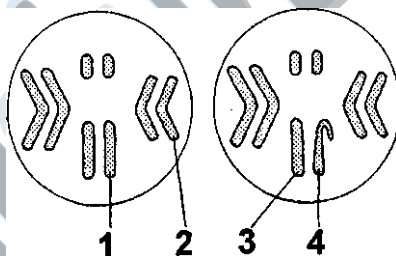
104. Study the pedigree chart of a certain family given below. It is related to Sickle-cell anaemia.



The trait traced in the above pedigree chart is

(a) dominant X-linked (b) recessive X-linked (c) Autosomal dominant (d) Autosomal recessive

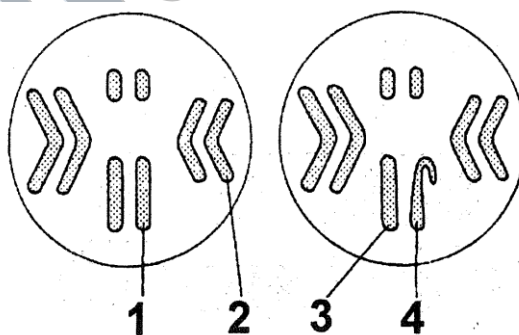
105. The diagram refers to the chromosome complement of each sex of fruit fly shown in the diagram.



By which number is a Y chromosome labelled?

(a) 1 (b) 2 (c) 3 (d) 4

106. The diagram refers to the chromosome complement of each sex of fruit fly shown in the diagram.



By which number is an autosome labelled?

(a) 1 (b) 2 (c) 3 (d) 4

107. **Column A**

I. Autopolyploidy

II. Aneuploidy

III. Allopolyploidy

IV. Nullisomy

The correct match is

(a) I-B, II-A, III-C, IV-D

Column B

A. $2n + 1$

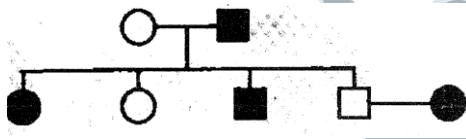
B. AAAA

C. AABBB

D. $2n - 2$

(b) I-D, II-A, III-B, IV-C

108. From the pedigree of a family given below, it is clear that the trait is inherited as dominant autosomal trait. What will be the genotype of mother and father.



- (a) mother is aa and father is Aa
(b) father is AA and mother is aa
(c) father is Aa and mother is Aa
(d) none of the above.

109. Which of the following male animals is NOT heterogametic?

animal	chromosome complement
(a) fruit fly	$2n = 6 + XY$
(b) fowl	$2n = 14 + XX$
(c) grasshopper	$2n = 16 + XO$
(d) human	$2n = 44 + XY$

110. A sex-linked allele NEVER passes from a

- (a) man to his sons
(b) woman to her daughters
(c) man to his grandsons
(d) woman to her granddaughters

111. **Column A**

- I. Gregor Mendel
II. Sutton and Boveri
III. Henking
IV. Thalassemia

The correct match is

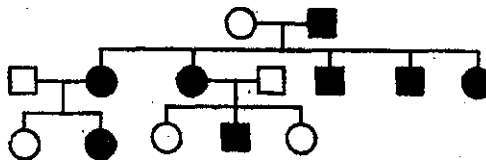
- (a) I-(a)I-B, II- A.III-D, IV-C
(c)I-D, II-B, III-A, IV-C

Column B

- A. Chromosomal theory of Inheritance
B. Law of Inheritance
C. Mendelian disorder
D. Discovered x-body

- (b)I-D,II-A, III-B.IV-C
(d)I-B,II-C,III-D,IV-A

112. In a family, father had a trait but mother did not. All their sons and daughters had this trait. The same trait was found in some grand daughters, though daughters were married to normal persons.



In this pedigree the genotypes of father, mother and husbands of their daughters are

- (a) father is AA, mother is aa, husbands are aa
(b) father is AA, mother is aa, husbands are AA
(c) father is aa, mother is Aa, husbands are Aa

(d) father is AA, mother is AA, one husband is Aa and second one is aa.

113. **Column A**

- I. Gene
- II. IT
- III. Alternate form of gene
- IV. TtRrxTtRr

The correct match is

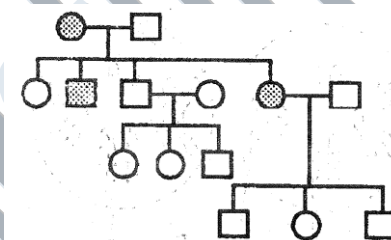
- (a) I-B, II- A, III-D, IV-C
- (c) I-D, II-B, III-A, IV-C

Column B

- A. Homozygote
- B. DMA
- C. Dihybrid cross
- D. Allele

- (b) (b) I-D, II-A, III-B, IV-C
- (d) I-B, II-C, III-D, IV-A

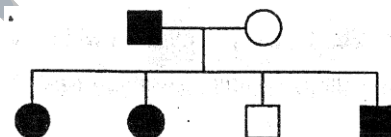
114. Study the pedigree chart of a certain family .given below. It is related to myotonic dystrophy.



The trait traced in the above pedigree chart is

- (a) dominant X-linked
- (b) recessive X-linked
- (c) Autosomal dominant
- (d) recessive Y-linked

115. Study the pedigree chart of a certain family given below and select the correct conclusion which can be drawn for the character.



- (a) The parents could not have had a normal daughter for this character
- (b) The trait under study could not be colour-blindness
- (c) The male parent is homozygous dominant
- (d) The female parent is heterozygous

116. **Column A**

- I. Linkage
- II. Mutation
- III. Crossing over
- IV. Polyploidy

The correct match is

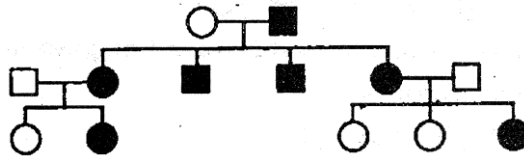
- (a) I-B, II-C, III-A, IV-D
- (c) I-B, II-D, III-C, IV-A

Column B

- A. Recombination of genes
- B. More than two sets of chromosomes
- C. Morgan
- D. Hugode Vries

- (b) I-C, II-D, III - A, IV-B
- (d) I-B.II-D.III-A, IV-C

117. In the given pedigree, indicate whether the shaded symbols indicate -



- (a) dominant
(c) codominant

- (b) recessive
(d) it can be recessive or dominant both.

118. **Column A**

- I. Removal of anther
II. Laws of inheritance
III. Multiple allelism
IV. Universal donor

The correct match is

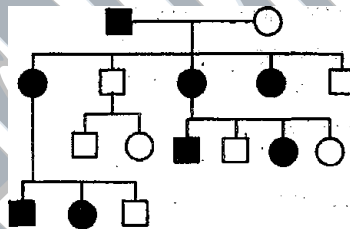
- (a) I-B, II-D, III-A, IV-C
(c) I-B, II-D, III-C, IV-A
(d) 9 1 10 4

Column B

- A. Human blood group
B. Emasculation
C. Blood group O
D. Mendel

- (b) I-C, II-D, III-A, IV-B
(d) I-B, II-A, III-D, IV-C

119. Identify the type of inheritance shown in the diagram.



- (a) dominant X-linked (b) recessive X-linked (c) dominant Y-linked (d) recessive Y-linked

120. Polyploid wheat does NOT normally show an increase in

- (a) size (b) vigour (c) resistance to disease (d) length of life cycle.

121. Klinefelter's syndrome results from the fusion of

- (a) an X egg and a YY sperm. (b) an XY egg and an X sperm,
(c) an XX egg and a Y sperm. (d) an XX egg and a YY sperm.

122. Which of the following statements is NOT correct?

- (a) Mutations provide variation upon which natural selection can act.
(b) The vast majority of mutations produce alleles which are dominant.
(c) Mutations arise spontaneously, infrequently and at random.
(d) Mutation rate can be increased by artificial means

123. A comparison of the karyotypes of a normal human male and a male sufferer of Down's syndrome shows the latter to possess

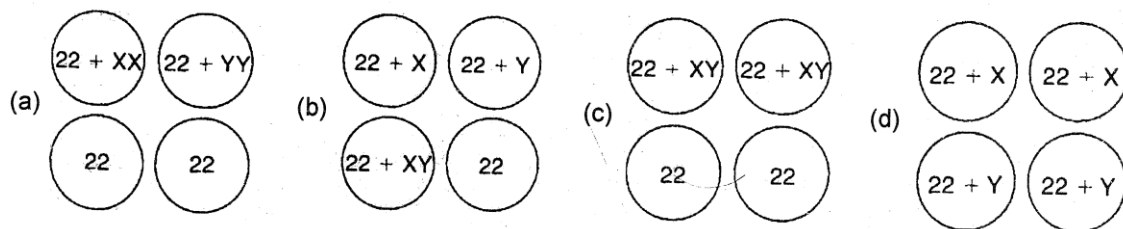
- (a) one extra chromosome (b) two Y chromosomes
(c) one extra pair of chromosomes (d) twice the normal number of chromosomes

124. A mutation is a

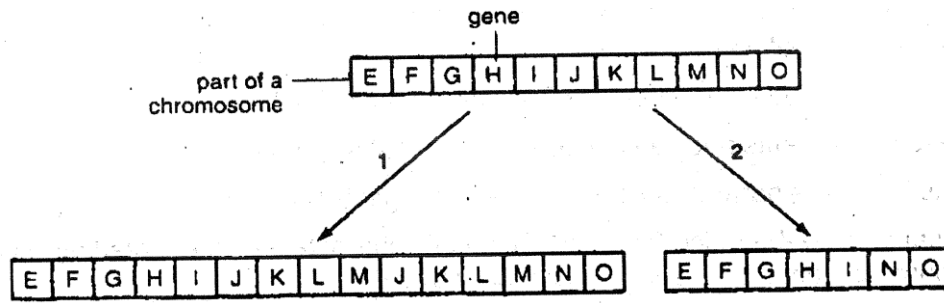
- (a) sudden temporary change in an organism's genetic material.
(b) change in phenotype followed by a change in genotype.
(c) change in hereditary material directed by a changing environment.

(d) change in genotype which may result in a new expression of a characteristic.

125. If a gamete mother cell of chromosome complement $44+XY$ suffers a non-disjunction at the first meiotic division, which of the following sets of gametes could result?



126. A human female will definitely be a haemophiliac if
- both of her parents are also haemophiliacs.
 - her mother is a carrier and her father is a haemophiliac.
 - her mother carries the allele for haemophilia on both X chromosomes.
 - her father is a haemophiliac and her mother is normal.
127. Haemophilia is a condition in which blood fails to clot or clots only very slowly. Studies of this human sex-linked trait show that
- every X chromosome carries the dominant allele.
 - a Y chromosome never carries the dominant allele.
 - both X and Y chromosomes can bear the recessive allele.
 - neither X nor Y chromosomes can bear the recessive allele.
128. **Column A**
- Test cross
 - Monohybrid ratio
 - Back cross
 - Dihybrid ratio
- The correct match is –
- I-B, II-C, III-A, IV-D
 - I-B, II-D, III-C, IV-A
- Column B**
- $9:3:3:1$
 - $Tt \times tt$
 - $Tt \times TT$
 - $3:1$
- I-C, II-D, III-A, IV-B
 - I-B, II-D, III-A, IV-C
129. Two organisms that are true-breeding for a certain genetic characteristic are mated and their offspring analyzed. Which of the following statements about this situation is true?
- Both parents are homozygotes.
 - The offspring are either all homozygotes or all heterozygotes.
 - The offspring represent the F_1 generation, the gametes produced by the offspring will carry only one allele for this gene.
 - All of the above
130. The following diagram shows two types of chromosome mutation.



- | | 1 | 2 |
|-----|-------------|--------------|
| (a) | duplication | deletion |
| (b) | duplication | substitution |
| (c) | inversion | deletion |
| (d) | inversion | substitution |

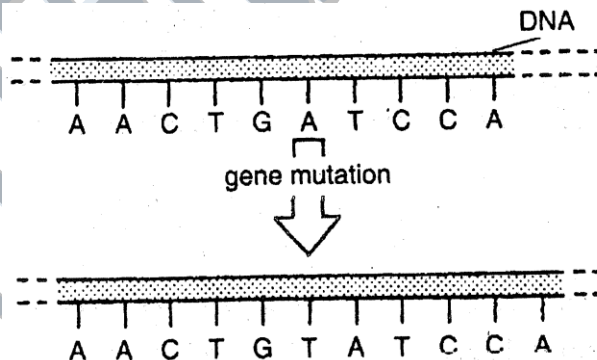
131. Given are the statements regarding linkages of genes:

- (i) The strength of the linkage is determined by the distance between the 2 genes in question.
- (ii) The strength of the linkage is directly proportional to the distance between the two genes.
- (iii) The two genes are said to be linked when they fail to show independent assortment.

Out of these statements:

- (a) all are correct (b) (i) and (ii) are correct (c) (i) and (iii) are correct (d) (ii) and (iii) are correct

132. What name is given to the type of gene mutation illustrated in the following diagram?



- (a) inversion (b) deletion (c) insertion (d) substitution

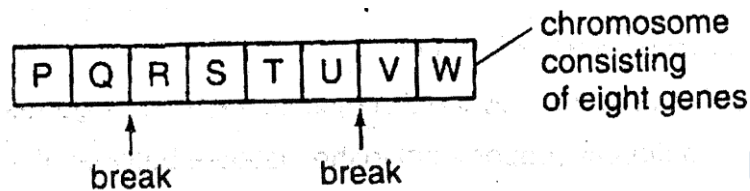
133. Bateson used the terms coupling and repulsion for linkage and crossing over. Name the correct parental or coupling type along with its cross over or repulsion:

- (a) Coupling aaBB, aabb; Repulsion AABB, aabb (b) Coupling AABB, aabb; Repulsion AABB, AAbb
 Coupling AAbb, aaBB; Repulsion AaBb, aabb (d) Coupling AABB, aabb; Repulsion AAbb, <,aB8

134. A and B genes are linked. What shall be genotype of progeny in a cross between AB/ab and ab/ab?

- (a) AAbb and aabb (b) AaBb and aabb (c) AABB and aabb (d) None of these

135. The chromosome shown in the diagram below became broken at the points indicated by arrows and the genes between these points became inverted.



The resulting order of the genes was

- (a) PQUTSRVW (b) VWUTSRQP (c) PQTURSVW (d) VWUTSRPQ.

136. Crossing over occurs between-
 (a) Sister chromatids (b) Non-sister chromatids (c) Non-homologues (d) All the above
137. The no. of linkage groups in *Drosophila*, *Pisum*, corn and mice are-
 (a) 4, 7, 10, 19 respectively (b) 4, 7, 10, 21, respectively
 (c) 4, 7, 10, 21 respectively (d) 10, 12, 17, 20 respectively
138. Sickle cell anemia has not been eliminated from the African population because-
 (a) It is controlled by recessive gene (b) It is not a foetal disease
 (c) It provides immunity against malaria (d) It is controlled by dominant gene
139. Cri-du-chat syndrome in humans is caused by-
 (a) Fertilisation of an XX egg by a normal Y-sperm (b) Loss of half of the short arm of chromosome 5
 (c) Loss of half of the long arm of chromosome 5 (d) Trisomy of the 21st chromosome
140. If a colourblind woman marries a normal visioned man.
 (a) All normal visioned (b) One-half colourblind and one-half normal
 (c) Three-fourths colourblind and one-fourth normal (d) All colourblind
141. Which of the following is suitable for experiments on linkage?
 (a) MBBxaabb (b) AaBbxAa'Bb (c) aaBBxaaBB (d) AAbb x AaBB
142. Linkage reduces the frequency of-
 (a) hybrids (b) all parental types
 (c) homozygous recessive parents (d) heterozygous recessive parents
143. Two genes situated very close on the chromosome show -
 (a) no crossing over (b) high crossing over
 (c) hardly any crossing over (d) only double crossing over
144. Which of the following statements about mutations is *false*?
 (a) Mutations are the source of new alleles for genes.
 (b) Organisms are able to create mutations to meet their specific needs.
 (c) Mutations are random events and can happen in any cell at any time.
 (d) Most mutations tend to be harmful or have no effect on organisms.
145. Linkage was discovered by -
 (a) Mendel in *Pisum sativum* (b) Beadle in *Neurospora crassa*
 (c) Bateson in *Lathyrus odoratus* (d) Morgan in pea
146. Chromosomal aberration occurs due to
 A. deletion B. duplication C. inversion D. translocation.
 (a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
147. What is not true of law of independent assortment?

- A. Applicable to all the dominant alleles
- B. Applicable to all genes on the same chromosome
- C. Not applicable to genes present on the same chromosome
- D. Applicable to all recessive alleles

(a) A, C,D (b)A, B,C,D (c) B, C, D (d)A,B,D

148. A pea plant that is heterozygous for the flower gene makes gametes. What is the probability that one of its gametes contains the recessive white allele for flower color?

(a)0% (b)25% (c)50% (d) 75%

149. Which of the following is not a dominant trait?

A. Colourblindness B. Rhfactor C. Albinism D. Haemophilia

(a)A, C,D (b)A,B,C, D (c) B, C, D (d)A, B,C

150. Consider a gene that has two alleles and shows complete dominance. When two heterozygotes for this gene breed, they have a 25 percent chance of producing a homozygous recessive offspring. The next time they breed, what are the chances that they will once again have a homozygous recessive progeny?

(a)0% (b)25% (c)50% (d) 75%

151. Which contributed to the success of Mendel?

A. Selection of pea plant B. His knowledge of biology
C. Consideration of one character at one time D. He had knowledge of linkage

(a) A, C,D (b)A,B, C,D (c)A,C (d)A,B, C

152. If the sequence of genes on a chromosome is changed from ABCDEFG to ABCDFEG then it is -

(a) Addition (b) Deletion (c) Substitution (d) Inversion

153. Individuals with patches of other sex is called-

(a) Gynandromorph (b) Androgynans (c) Andromorphs (d) gynomorph

154. In a particular plant, two genes control leaf shape and color. Round leaves (*R*) are dominant to jagged leaves (*r*). Yellow fruits (*Y*) are dominant to white fruits (*y*). A true-breeding round-leaved, yellow-fruited plant is mated with a jagged-leaved, white-fruited plant. What are the genotypes of the plants involved in this cross?

(a) *RRYY* x *RRYY* (b) *RRYY* x *rryy* (c) *RrYy* x *RrYy* (d) *RrYy* x *rryy*

155. Alleles represent

A. different forms of a gene B. same loci on homologous chromosomes
C. two or more forms D. none of these

(a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C

156. If Mohan has 6 girls, the percentage of probability of 7th child to be a girl will be-

(a) 25 % (b) 50 % (c) 75% (d) 100%

157. Which of the following is a mutagen?

A. Ionizing radiations B. Gamma rays C. UV rays D. Nitrous acid

(a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C

158. Marriages between close relatives are avoided in some Indian communities. It is also supported by biologists because-

(a) It induces mutation (b) It induces multiple births
(c) It induces recessive alleles to come together (d) It induces abnormalities in child birth

159. Genes for colour blindness in humans are carried by
 A. abnormal sex B. father C. mother D. none of the above
 (a) A, C, D (b) A, B, C, D (c) B, C (d) A, B, C
160. Test cross does not involve
 A. crossing between two genotypes with dominant trait
 B. crossing between two genotypes with recessive trait
 C. crossing the F₁ hybrid with double recessive genotype
 D. crossing between two F₁ hybrids
 (a) A, B, D (b) A, B, C, D (c) B, C, D (d) A, B, C
161. Mendel proposed -
 A. dominance B. segregation C. incomplete dominance D. independent assortment
 (a) A, C, D (b) A, B, D (c) B, C, D (d) A, B, C
162. Which of the following is a dominant trait-
 (a) Rh-factor (b) Albinism (c) Colour blindness (d) Haemophilia
163. In 1900 Mendelism was rediscovered by:
 A. Morgan B. de Vries C. Correns D. Tschermak
 (a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
164. Given below is a highly simplified representation of a human sex chromosome from a karyotype. The genes 'a' and 'b' could be of-

Missing Figure

- (a) Colour blindness and recessive blood group (b) attached earlobe and recessive blood group
 (c) Haemophilia and red-green colour blindness (d) Phenylketonuria and Laenophitia
165. Crossing over involves
 (a) Chiasmata (b) Recombination (c) Termination (d) All
166. Given below is a representation of a kind of chromosomal mutation. What is the kind of mutation represented ?

Missing Figure

- (a) Deletion (b) Duplication (c) Inversion (d) Reciprocal translocation
- Crossing over that results in genetic recombination in higher organism occurs between-
 (a) Sister chromatids of bivalent (b) Non-sister chromatids of a bivalent
 (c) Two daughter nuclei (d) Two different bivalents
167. A. Linkage prevents segregation of genes present on the same chromosomes.
 B. XY sex chromosomes were discovered by Nettie Stevens
 C. Complete linkage has been reported in male *Drosophila*.
 D. Term linkage was given by Correns.

- (a) All are correct (b) All are incorrect
(c) All are correct except D (d) Only D is correct
168. A. Myotonic dystrophy is an autosomal dominant trait.
B. Sickle cell anemia is an autosomal recessive trait.
C. Cystic fibrosis is a Mendelian disorder.
D. Failure of segregation of chromatids during cell division cycle results in the gain or loss of a chromosome(s) called aneuploidy.- .
(a) Only C is incorrect (b) All incorrect (c) Only C is correct (d) All are correct.
169. 1:1:1:1 ratio of progenies can be obtain if the plants for crossing are :
A. TTRRxttRR B. TtRrxtttr C. TtRRxtttr D. TtrrxttRr
(a)A,C,D (b)A,B,C, D (c) B, D (d)A,B,C
170. Mendel cross tall and dwarf pea plants and obtained all tall plants in the F₁ generation and tall and dwarf plants in the ratio of 3 : 1 in the F₂ generation. From these results he deduced the:
A. Law of dominance B. law of Independent assortment
C. Law of segregation D. None of the above
(a)A,C (b)A, B,C, D (c) B, C, D (d)A,B, C
172. In case of *Mirabilis* Tt Rr (pink) plant is self crossed, what will be the characteristic / characteristics of the result?
A. 75% plants are tall
B. 25% plants will have Red flower
C. 25% plants will have white flower
D. 50% plants will have pink flower
(a)A,C (b)A,B,C,D (c) B, C, D (d)A,B, C
173. Which one / ones is /are correct about the gametes produced b' TtRf? It is not the case of linkage
A. 4 types of gametes will be formed. B. Tht, jntage of each gamete is 25.
C. Each gamete is diploid D, Out of 4 gametes 2 gametes have all dominant genes,
(a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B
174. A. Sutton united the knowledge of chromosomal segregation with Mendelian principles and called it the chromosomal theory of inheritance.
B. Genes are the units of inheritance.
C. There are 6 different alleles which determine ABO blood types.
D. The phenotypic ratio of Mendelian monohybnr* cross is 3 :1
(a) All are correct (b) All are incorrect (c) A, B, D are correct (d) A, B, and C are correct
175. Which one /ones of followings is /are correct regarding the Mendelian dihybrid cross?
A. The F₂ phenotypic ratio is 9 : 3 : 3 : 1
B. Law of independent assortment can be explained on the basis of the cross.
C. F₂ generation is obtained through the cross between F₁ plants with one of the two parental plants.
D. The gametes produced by F₁ plants are 4 types in 1:1:1:1 ratio
(a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, D
176. Which is genetically-transmitted diseases?
A. Colourblindness B. Haemophilia C. Muscular dystrophy D. None of these
(a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C

177. If Tt Pea plant mates with Tt Pea plant what will be characteristic / character of offsprings?
 A. 75% Plants tall B. 25% plants dwarf
 C. 50% plants are homozygous D. 50% plants are heterozygous
 (a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
178. Klinefelter's syndrome is due to-
 (a) One X and Two Y (b) One Y and Two X (c) One X only (d) Only Y only
179. *Drosophila melanogaster* (fruit fly) is suitable for genetic studies because:
 A. It can be grown on simple synthetic medium in the laboratory.
 B. Life Cycle is short (about 2 weeks)
 C. A single mating produces large number of progenies.
 D. Visible sexual dimorphisms and many types of genetic variations can be easily observed,
 (a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
180. Haemophilia is due to-
 (a) Factor VI (b) Factor-VII (c) Factor VIII (d) Factor IX
181. Turner's syndrome is-
 (a) XO (b) XXY (c) XXX (d) XYY
182. If a man of blood group A marries a woman of blood group B, their children can be of the blood group
 (a) A only (b) B only* (c) O only (d) A or B or AB or O
183. Which one / ones is / are correct about the person suffering from Klinefelter's syndrome?
 A. It is a case of trisomy. B. The sufferer has 47 chromosomes.
 C. He / She is fertile D. Tall stature with breast development,
 (a) A, B, D (b) A, B, C, D (c) B, C, D (d) A, B, C
184. In a medico-legal case of accidental interchange between two bodies in a hospital the body of the blood group 'A' could not be rightly given to couple with-
 (a) Husband of 'O' group and wife of 'AB' group (b) Husband of 'A' group and wife of 'B' group
 (c) Husband of 'B' group and wife of 'O' group (d) Husband of 'AB' group and wife of 'A' group
185. Which is the example of chromosomal disorder?
 A. Turner's syndrome B. Down's syndrome
 C. Klinefelter's syndrome D. None of the above
 (a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
186. Which of the following symbols represents the parental generation of a cross?
 (a) P (b) \wedge (c) P (d) vAa
187. Which of the following statements summarizes an observation Gregor Mendel made in refutation of the blending theory of inheritance?
 (a) When a red plant was crossed with a white plant, the resulting offspring were pink.
 (b) Features of offspring often are not intermediates of their parents' traits.
 (c) Gametes carrying different types of alleles could not fuse successfully.
 (d) After meiosis, two copies of a given gene end up in the same gamete.

188. Which of the following symbols represents a recessive allele?
 (a) Tt (b) a (c) D (d) XY
189. Test cross in *Drosophila* that is cross between Red eyed hybrid female and white eyed male showed.
 A. red eyed female = 25% B. White eyed female = 25%
 C. Red eyed male = 25% D. White eyed male = 25%
 (a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
190. Which of the following statements is a basic summary of Mendel's laws?
 (a) All good human genetic traits are dominant, and harmful traits are recessive.
 (b) The pattern of inherited characteristics of organisms is not predictable.
 (c) Alleles separate into different gametes during meiosis, and the separation of alleles for one gene does not affect the separation of alleles for other genes.
 (d) Recessive alleles cause the death of the gamete.
191. Patterns of sex linked inheritance conform to:
 A. Mendel's concept of dominance & recessive B. Mendel's law of segregation
 C. Mendel's law of parental equivalence. D. None
 (a) A, C (b) B, C (c) D (d) A, B, C
192. Which of the following expresses Mendel's law of equal segregation?
 (a) All dominant alleles of different genes segregate into separate cells from the recessive alleles.
 (b) Two copies of a gene separate during meiosis and end up in different gametes.
 (c) When gametes form, the genes originally from one parent all end up in different gametes from the genes originally from the other parent.
 (d) Gametes with recessive alleles will fuse only with each other.
193. The recombination frequency:
 A. between two genes cannot exceed 50%
 B. is inversely proportional to the distance between linked genes.
 C. Helps to determine, the relative order of genes and distances between them on a chromosome.
 D. Is equal to map unit
 (a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
194. If a person has one copy of each of two different alleles for a given gene, the person is for that trait,
 (a) heterozygous (b) homozygous (c) recessive (d) true-breeding
195. Which of the following statements is generally true?
 (a) A dominant allele determines the phenotype when paired with a recessive allele.
 (b) A recessive allele is weaker than a dominant allele.
 (c) A recessive allele does not make its gene product when paired with a dominant allele.
 (d) A dominant allele is always better for an organism.
196. Mendel's laws were able to predict accurately the pattern of inheritance for situations in which
 (a) alleles are affected by their environment.
 (b) alleles show complete dominance.

- (c) alleles of one gene alter the effect of a different gene.
- (d) a given character is determined by more than one gene.
197. If T = tall and t - short, the genotype of an animal with the "short" phenotype must be
 (a) Tt (b) TT (c) tt (d) t
198. Which of the following symbols correctly represents a person who has a homozygous genotype?
 (a) $I^A I^O$ (b) WW (c) XY (d) w^+
199. Which of the following symbols represents a potential genotype of a standard (nongamete) body cell?
 (a) Rr (b) red (c) A (d) allele. $<$.
200. Polyploidy
 A. Is the occurrence of more than 2 sets of chromosomes or genome
 B. Is resulted due to non-formation of spindle fibres.
 C. Is resulted due to failure of cytokinesis
 D. Is more common in plants
 (a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
201. In a family pedigree:
 A. Circles represent males
 B. Squares represent females
 C. A solid / blackened symbol represents the individual with a recessive trait always
 D. Mating is shown by a horizontal line connecting a male and a female symbol
 (a) Only A (b) Only B (c) Only C (d) Only D
202. Which is / are correct is correct about F_2 generation obtained by Mendelian dihybrid cross?
 A. Phenotypic ratio is $9 : 3 : 3 : 1$ B. The ratio of homozygous plants is $1 : 1 : 1 : 1$
 C. $1/4$ plant is completely heterozygous D. F_2 generation is obtained through selfing of F_1 plants
 (a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
203. Which of the following conditions in humans is correctly matched with its chromosomal abnormality linkage ?
 (a) Erythroblastosis foetalis -X -linked (b) Down's syndrome-44 autosomes + XXY
 (c) Klinefelter's syndrome-44 autosomes + XXY (d) Colour blindness-Y-linked
204. Being able to use a Punnett square to track the pattern of inheritance in a two-characteristic cross (e.g., pea seed color and seed shape) demonstrates Mendel's idea of
 (a) allele segregation. (b) blending inheritance.
 (c) environmental influences on genes. (d) independent assortment.
205. What is the meaning of "dominant" and "recessive" relative to alleles for a given gene?
 (a) The dominant allele represents a better trait than the recessive allele.
 (b) The dominant allele is stronger than the recessive allele.
 (c) The dominant allele determines the phenotype of the organism.
 (d) The dominant allele is not expressed when the recessive allele is present.
206. Mendel's primary contribution to our understanding of genetic inheritance was
 (a) the idea that genes are found on chromosomes.
 (b) providing a mechanism that explains patterns of inheritance.
 (c) describing how genes are influenced by the environment.

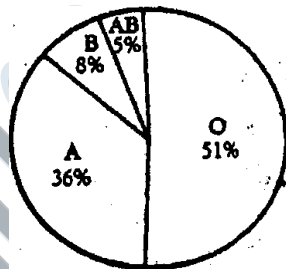
- (d) determining that the information contained in DNA codes for proteins.
207. Which of the following statements is true?
- (a) Mendel's laws are less accurate than Punnett square results.
 - (b) Mendel's laws are useful only in unusual situations.
 - (c) Mendel's laws always correctly determine how genes are inherited.
 - (d) Mendel's laws always correctly predict the phenotype of an organism.
208. Which of the following statements is *not* true?
- (a) Two organisms with the same genotype may have different phenotypes.
 - (b) Two organisms with the same phenotype may have different genotypes.
 - (c) A heterozygous organism may have the same phenotype as a homozygous organism.
 - (d) A heterozygous organism has the same number of alleles for a given gene as a homozygous organism.
209. Which of the following represents the gametes that can be formed by an individual with the genetic makeup: *FfGgHH*
- (a) *FGH, FgH, fGH, fgH*
 - (b) *Ff, Gg, HH*
 - (c) *FG, FH, Fg, fH, fG, fg, GH, gH*
 - (d) *FfGhHH, FFGGHH, ffgghh*
210. Mutations may be harmful, beneficial, or have little impact. Which of the following choices states one reason that a mutation might have little impact?
- (a) In eukaryotes, a mutation that occurs in an important gene will always be repaired properly.
 - (b) In eukaryotes, a mutation in the noncoding portion of the genome will not affect the organism.
 - (c) Mutations that change the DNA of a coding gene always improve the organism.
 - (d) Mutations that occur in the gamete-producing cells cannot be passed on to offspring and therefore have no impact.
211. The leaf color of a certain plant is controlled by one gene. For that gene, the allele *G* = orange and *g* = green. You have a plant with orange leaves, but do not know whether that plant's genotype is *GG* or *Gg*. If you cross your unknown plant with one of the plants whose genotype is listed below, you will be able to determine your unknown's genotype. With which plant should you cross it?
- (a) *GG*
 - (b) *Gg*
 - (c) *gg*
 - (d) A plant of a different species.
212. A plant with the genotype *ss* mates with itself and produces all *s.s* offspring. The parental plant is
- (a) heterozygous
 - (b) completely dominant
 - (c) mutated
 - (d) true-breeding.
213. The best way to get accurate results from a probability exercise is to
- (a) choose an example with incomplete dominance
 - (b) know the answer in advance.
 - (c) choose an example that will come out 50/50
 - (d) make a large number of observations.
214. A Punnett square is used to
- (a) determine the source of new alleles.
 - (b) determine how many genes control a given trait.
 - (c) predict the gametes that will be produced by an organism.
 - (d) predict the outcome of a genetic cross.
215. In Mendel's model of particulate inheritance, what he called "particles" we now refer to as
- (a) genes.
 - (b) chromosomes.
 - (c) homozygotes.
 - (d) heterozygotes.
216. _____ represent(s) an example of how applied genetics is becoming an increasingly important area of biology.
- (a) The study of inherited human disease
 - (b) Recent advances in plant and animal breeding
 - (c) Improved techniques for criminal investigation and the need for better methods to settle paternity suits

- (d) All of the above
217. The chance of a parent's passing on a given gene to a child ____ each time he or she has another child,
 (a) is reduced (b) is increased (c) is the same (d) changes
218. Cystic fibrosis is caused by a recessive gene. If C = normal and c = cystic fibrosis, how can a child with cystic fibrosis have two parents that do not have cystic fibrosis?
 (a) The child has a genotype of CC. (b) The parents have genotypes of CC and Cc.
 (c) The parents have genotypes of Cc and Gc. (d) The child has a genotype of Cc.
219. Which of the following choices represents the genotype of an individual organism?
 (a) BbCCdd (b) BCd (c) bCd (d) BbCd
220. Most human genetic characters are
 (a) controlled by one gene (b) not inherited according to Mendel's laws,
 (c) controlled by more than one gene (d) not heritable.
221. Your mother decides she would like some of the pink flowered roses. Which cross would give you the most pink flowered plants?
 (a) Red x red (b) Red x pink (c) Red x white (d) Pink x pink
222. Hemophilia is caused by-
 (a) X chromosome in male (b) X chromosome is both male and female
 (c) X chromosome in female (d) Y chromosome is male
223. Person I (P - I) — Shows tall stature with feminised character (Gynaecomastia)
 Person II (P - II) — Shows short stature, Sterility underdeveloped feminine characters webbed neck
 Person III (P - III) — Shows short statured, small head furrowed tongue, creased broad palm, retarded physical, psychomotor and mental developed.
 Identify the syndromes
- | | p-i | P-II | p-m |
|-----|------------------------|------------------------|-------------------|
| (a) | Turner's syndrome | Klinefelter's syndrome | Down's syndrome |
| (b) | Down's syndrome | Klinefelter's syndrome | Turner's syndrome |
| (c) | Klinefelter's syndrome | Turner's syndrome | Down's syndrome |
| (d) | Klinefelter's syndrome | Down's syndrome | Turner's syndrome |
224. Mutations can be induced with
 (a) Gamma radiations (b) Infra Red radiations (c) IAA (d) Ethylene
225. Study the two cases carefully.

	Mother	Father	Children
Case 1	With disease	Normal	Sons always with disease
Case 2	With disease	Normal	Sons and daughters could show disease

The correct interpretation of the 2 cases is "

- (a) case 1 : X-linked recessive disease; case 2 : autosomal recessive disease
 (b) case 1: Y-linked recessive disease; case 2 : X-linked recessive disease
 (c) case 1 and 2: X-linked recessive disease; case 2 : autosomal dominant disease
 (d) None of the above

226. The pie chart shows the results of a survey of the incidence of blood groups A, B, AB & O amongst people in India.
- Which of the following conclusions can be deduced from the diagram ?
- (a) Only 5% of individuals are heterozygous for blood group alleles.
 (b) Group O is the most common as it is the homozygous recessive group.
 (c) The alleles for blood group A and B are dominant to the allele for blood group O.
 (d) Any individual, selected at random from the sample population, has a 1 in 20 chance of being blood group AB.
- 
227. To study the natural phenomena of inheritance, Mendel selected the pea plants. Which of the following properties were suitable for his studies? , , ,
- I. Plants were easily grown in garden soil with a considerably shorter generation time
 II. Plants would easily self pollinate or cross pollinate in nature
 III. Many parts of the plant such as pod, seed, flower and cotyledons showed distinct phenotypes
 IV. Pea plants do not require the true-breeding lines for hybridization experiments,
- (a) I, II, III (b) I, III, IV (c) II, III, IV (d) I, III
228. A true-breeding, purple-flowered pea plant is crossed with a white-flowered plant. They produce two F_1 progeny that are then mated with each other to yield 10 F_2 plants. The F_2 contains 5 purple-flowered plants and 5 white-flowered plants. Which of the following is the best explanation for the F_2 results?
- (a) They are exactly what is expected from Mendel's laws.
 (b) They are similar to, but not exactly, what Mendel's laws predict.
 (c) They are rather different from predictions, probably due to small sample size.
 (d) The F_1 plants must have suffered a mutation before mating.
229. A person with unknown blood group under ABO system, has suffered much blood loss in an accident and needs immediate blood transfusion. His one friend who has a valid certificate of his own blood type, offers for blood donation without delay. What would have been the type of blood group of the donor friend?
- (a) Type A (b) Type B (c) Type AB (d) Type O
230. A chestnut-colored horse is mated with a cremello-colored horse. Over a 10-year period, all of their offspring are palominos. This pattern of inheritance is best explained by
- (a) complete dominance. (b) incomplete dominance,
 (c) multiple gene effects. (d) environmental effects on genes.
231. Which one of the following conditions correctly describes the manner of determining the sex in the given example?
- (a) Homozygous sex chromosomes (XX) produce male in *Drosophila*
 (b) Homozygous sex chromosomes (ZZ) determine female sex in birds
 (c) XO type of sex chromosomes determine male sex in grasshopper
 (d) XO condition in humans as found in Turner Syndrome, determines female sex
232. Consider the following four statements A, B, C and D are select the right option for incorrect statements.
- A. Mendelian experiments has a large sampling size, which gave greater credibility to the data that he collected
 B. Recessive allele influences the appearance of the phenotype even in the presence of an alternative allele

C. Multiple alleles can be found only when population studies are made

D. In F_2 generation of a Mendelian monohybrid cross, the tall and dwarf traits were identical to their parental types and show blending

The incorrect statements are

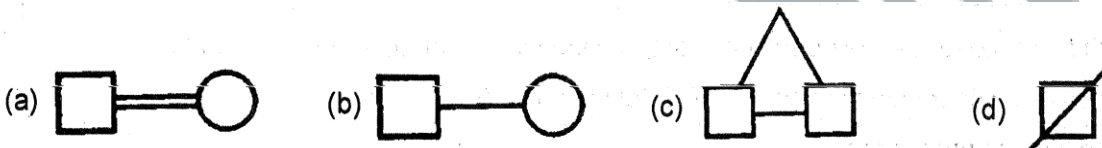
233. Morgan carried out several dihybrid crosses in fruit fly and found that
- (a) Loosely linked genes show low recombination
 - (b) The strength of linkage between genes of white eye and miniature wing is lower than the genes of yellow body and white eye
 - (c) Tightly linked genes show equal amount of parental and recombinant types in F_2 generation
 - (d) All genes segregate independently of each other and the F_2 ratio deviated very significantly from the 9: 3 : 3 :1
234. Select the odd one out w.r.t chromosomal theory of inheritance
- (a) It was proposed by Sutton and Boveri
 - (b) Behaviour of chromosomes is parallel to behaviour of genes
 - (c) Chromosomes and genes occur in pairs in diploid and haploid cells respectively
 - (d) The paired condition of both chromosomes as well as Mendelian factors is restored during fertilization
235. Choose the correct incorrect option.
- (a) Recombination and mutation are phenomena that lead to variations in DNA.
 - (b) Chromosomal aberrations are commonly observed in cancer cells
 - (c) A change in a single base pair of DNA is not sufficient to cause mutation
 - (d) Point mutation arises due to change in a single base pair
236. Find out the wrong option.
- (a) Snapdragon or $yAnf/rr/7/A?t/T?$ shows incomplete dominance
 - (b) Theoretically, the modified allele could be responsible for the production of the normal / less efficient / non functional enzymes or no enzyme at all.
 - (c) Sahiwal cows in Punjab is well known Indian breed.
 - (d) Control crosses can be performed in human being
237. I. Inborn error of metabolism.
- II. Homozygous recessive autosomal alleles on chromosome 12 cause absence of the specific enzyme
- III. A specific amino acid does not change into tyrosine
- IV. Accumulation of phenylpyruvic acid and other derivatives leading to mental retardation.
- The above facts refer to
- (a) Phenylketonuria
 - (b) Muscular dystrophy
 - (c) Turner's syndrome
 - (d) Down's syndrome
238. Which of the following options is wrong?
- (a) S. C. A is the classical example of gene mutation
 - (b) Deletion or gain (insertion / duplication) of a segment of DNA does not result in alteration in chromosome
 - (c) Frameshift mutation is resulted to deletion or insertion of base pairs of DNA
 - (d) Mutation changes genotype and phenotype
239. Select the incorrect statement w.r.t pedigree analysis .

- (a) Solid symbol shows the unaffected individual
- (b) It is useful for genetic counsellors
- (c) Proband is the person from which case history starts
- (d) It is an analysis of traits in a several generations of a family

240. Morgan used *Drosophila* as experimental material because

- (a) It cannot be reared and bred under lab conditions
- (b) A single mating produces very few offsprings
- (c) It has high number of morphologically similar chromosomes
- (d) It has a short life span

241. In pedigree analysis, symbol given for consanguineous marriage is



242. Starch grain size in garden pea, flower colour in 4' O clock plant and heterozygous individual for sickle cell anaemia are the examples of

- (a) Incomplete dominance
- (b) Nonallelic interaction
- (c) Co-dominance
- (d) I nterallelic interaction

243. Significance of the telomere is that it-

- (a) Seals the chromosome
- (b) Stretches the spindle fibres
- (c) Synthesis proteins
- (d) All of these

244. From heredity point of view which marriage is not suitable-

- (a) Man Rh(-) Woman Rh(-)
- (b) B.m Rh(+)
- (c) Both Rh(-)
- (d) Man Rh(+)

245. If a normal woman marries as albino man and their offspring's are half albino, half normal, the woman is-

- (a) Hamozygous normal
- (b) Hmozygous recersive
- (c) Heterozygous normal
- (d) Homozygous dominant

246. Where are bass bodies found ?

- (a) Sperms
- (b) Ova
- (c) Body cells (somative) of a man
- (d) Body cells (sometie) of a woman

247. Down's syndrome are due to-

- (a) Charge in sex chromosome
- (b) Change in autosomes
- (c) Charge in both autosomes and ex chromosomes
- (d) Mutation due to malratition

248. In a dihybrid cross where two parents differ in two pairs of contrasting traits like; seed colour yellow (YY) and seed colour green (yy) with seed shape round (RR) and seed shape wrinkled (r r), thenumberaf green coloured seeds (yy) among sixteen products of F₂ generation will be

- (a) 2
- (b) 4
- (c) 6
- (d) 8

249. Mendelian genetics applied on

- (a) Haploid
- (b) Diploid
- (c) Prokaryotes
- (d) Mycoplasma

250. Among the seven pairs of contrasting traits'in pea plant as studied by MendeJv the numberof traits related to; flower, pod and seed respectively were

- (a) 2,2,2
- (b) 2,2,1
- (c) 1,2,2
- (d) 1,1,2

251. Mendel studies which type of inheritance.

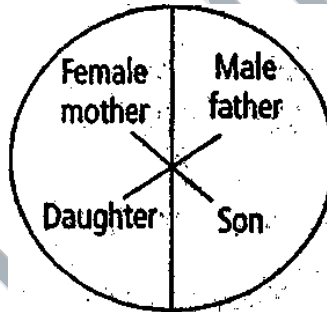
- (a) Polygenic inheritance (b) Quantitative inheritance
(c) Quantitative inheritance (d) Cytoplasmic inheritance

252. When both alleles of a pair are fully expressed in a heterozygote; they are called

- (a) lethals (b) co-dominants (c) semi-dominants (d) recessive allele.

(d) Charles Darwin, who observed a wide variety of organisms during sea voyage

253. Represented below is the inheritance pattern of a certain type of traits in humans. Which one of the following conditions could be an example of this pattern?



- (a) Phenylketonuria (b) Sickle cell anaemia (c) Anger pNliav (d) Thalassemia

254. A test cross is carried out to :

- (a) determine the genotype of a plant at F_2 .
(b) predict whether two traits are linked. -
(c) assess the number of alleles of a gene.
(d) determine whether two species or varieties will breed successfully.

255. The idea of mutations was brought forth by:

- (a) Hugo de Vries, who worked on evening primrose
(b) Gregor Mendel, who worked on *Pisum sativum*
(c) Hardy Weinberg, who worked on allele frequencies in a population

256. If the frequency of an autosomal dominant allele is 0.6. Calculate the frequency of recessive phenotype in a population of 10,000

- (a) 1200 (b) 4000 (c) 1600 ; (d) 1000

257. Consider the following statements (A - D) each with one or two blanks,, <

A. (i)are commonly observed in cancer cells.

B. During (ii)purine is replaced by another purine.

C. Failure of (iii) _____ after telophase stage of cell division results in an increase in whole set of chromosomes

in an organism and this Phenomenon is known as (iv) , :

D. In Down's syndrome, the affected individual is short statured with (v) _____ round head and a partially open mouth.

Which one of the following option gives the Correctly fills Up for the respectively blank numbers from (i) to (v) in the Statements?

- (a) (iii) - Karyokinesis, (iv) - Polyploidy, (v) - Large
 (b) (ii) - Transversion, (iii) • Cytokinesis, (iv) - Chromosomal aberration
 (c) (i) - Chromosomal aberration, (iv) - Polyploidy, (v) - Small
 (d) (ii) - Transition, (iii) - Karyokinesis, (v) - Large
258. Mr. Siddarth is suffering from hypertrichosis and phenylketonuria. His father is heterozygous for phenylketonuria. The probability of Siddarth's sperm having one recessive autosomal allele and holandric gene is
 (a) 1/8 (b) 1/16 (c) 1/4 (d) 1/2
259. Some of the dominant traits studied by Mendel were :
 (a) round seed shape, constricted pod shape and axial flower position ,
 (b) green pod colour, inflated pod shape and axial flower position
 (c) yellow seed colour, violet flower colour and yellow pod, colour
 (d) axial flower position, green pod colour and green, seed colour
260. Which is correct for Turner's syndrome?
 (a) It is a case of monosomy. (b) It causes sterility in females,
 (c) Absence of Barr body, (d) All of the above.
261. In which of the following combination conclusion of independent assortment does not apply,
 (a) Pod form - plant height (b) Plant height-seed form
 (c) Plant colour - seed form (d) Pod-position - cotyledon colour
262. Test cross in plants or in *Drosophila* involves crossing
 (a) The F₁ hybrid with a double recessive genotype
 (b) Between two genotypes with dominant trait
 (c) Between two genotypes with recessive trait
 (d) Between two F₁ hybrids
263. If both parents are carriers for thalassemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child ?
 (a) 50% (b) 25% (c) 100% (d) No chance
264. Mendel's laws are explained by
 (a) chromosome behavior in mitosis. (b) chromosome behavior in meiosis.
 (c) cytokinesis in mitosis and meiosis. (d) Mendel's laws have not been explained.
265. Which Mendelian idea is depicted by a cross in which the F₁ generation resembles both the parents ?
 (a) Law of dominance (b) Inheritance of one gene (c) Co-dominance (d) Incomplete dominance
266. A mother who is blood type AB has a child who is AB also. A potential father is blood type O. A well-informed geneticist concludes that _____.
 (a) he cannot be the father (b) he might be the father, but it is unlikely
 (c) he is very likely to be the father (d) he or any other male of blood type O could be the father
267. F₂ generation in a Mendelian cross showed that both genotypic and phenotypic ratios are same as 1 : 2 : 1. It represents a case of:
 (a) Co-dominance (b) Dihybrid cross
 (c) Monohybrid cross with complete dominance (d) Monohybrid cross with incomplete dominance

268. The ____ rule of probability is useful in calculating the risk that certain individuals will inherit a particular genotype,
 (a) product (b) summation (c) additive (d) none of the above is correct
269. A normal, visioned man whose father was colour, blind, marries a woman whose father was also colour, blind. They have their first child as a daughter, what are the chance that this child would be colour, blind?
 (a) 100% (b) zero percent (c) 25% (d) 50%
270. Why didn't Mendel find linkage?
 (a) Some genes were linked, but they were too close together to cross over.
 (b) All seven genes were on separate chromosomes.
 (c) Mendel did detect linkage. He discovered this genetic phenomenon.
 (d) Some genes were linked, but they were too far apart for crossing over to be distinguished from independent assortment, or linked genes were never tested for at the same time in the same cross.
271. A limitation of pedigree analysis of human trait is
 (a) missing information about some members of the family
 (b) the relatively small numbers of children per generation
 (c) both a and b
 (d) none
272. A ratio of 12:3:1 is most characteristic of a cross involving _____.
 (a) 1 gene pair (b) 2 gene pairs (c) 3 gene pairs (d) 4 gene pairs
273. The incorrect statement with regard to Haemophilia is-
 (a) It is a recessive disease
 (b) It is a dominant disease
 (c) A single protein involved in the clotting of blood is affected
 (d) It is a sex-linked disease
274. The colour based contrasting traits in seven contrasting pairs, studied by Mendel in pea plant were
 (a) 1 (b) 2 (c) 3 (d) 4
275. Two crosses between the same pair of genotypes of phenotypes in which the sources of the gametes are reversed in which the sources of the gametes are reversed in one cross is known as-
 (a) Test cross (b) Dihybrid cross (c) Reverse cross (d) Reciprocal cross
276. A ratio of 9 : 3 : 3 : 1 is modified in complementary genes to-
 (a) 5 : 1 (b) 9 : 7 (c) 13 : 1 (d) 12 : 3 : 1
277. In *Mirabilis jalapa*, the number of F₂ red flowered plants is a cross of red flowered X white flowered would be-
 (a) 1 (b) 2 (c) 3 (d) 4
278. The genotypic ratio in the F₂ generation of a dihybrid cross is-
 (a) 9 : 3 : 3 : 1 (b) 1 : 2 : 2 : 4 : 1 : 2 : 1 : 2 : 1
 (c) 1 : 2 : 2 : 4 : 1 : 2 : 1 : 2 : 1 (d) 12 : 3 : 4
279. If a dwarf pea plant was treated with gibberellic acid, it becomes a tall, as tall pea plants. If these pea plants are crossed with pure plants, what would be the phenotypic ratio in F₁ generation.
 (a) All dwarf plant (b) 50% tall and 50% dwarf
 (c) 75% tall and 25% dwarf plant (d) 100% tall plants.
280. Which of the following statements is not true of two genes that show 50% recombination frequency ?
 (a) The genes are tightly linked
 (b) The genes show independent assortment
 (c) If the genes are present on the same chromosome, they undergo more than one crossovers in every meiosis
 (d) The genes may be on different chromosomes
281. If two persons with 'AB' blood group marry and have sufficiently large number of children, these children could be classified as 'A' blood group: 'AB' blood group: 'B' blood grouping 1 : 2 : 1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in 'AB' blood group individuals. This is an example of
 (a) Incomplete dominance (b) Partial dominance (c) Complete dominance (d) Codominance

282. Grain colour in wheat is determined by three pairs of polygene, Following the cross AABBCC (dark colour) X aabbcc (light colour) in F₂ generation what proportion of the progeny is likely to resemble either parent.
 (a) Half (b) Less than 5% (c) 100% (d) None of these
283. The possible blood group of children born to parents Lanning A and AB groups are-
 (a) O, A (b) A, B, AB (c) O, A, B (d) O, A, B, AB
284. Webbed neck is a characteristic of-
 (a) XXY (b) XY (c) XXY (d) XO
285. Down's syndrome is caused by an extra copy of chromosome number 21. What percentage of offspring's produced by an affected mother and normal father would be affected by this disorder.
 (a) 75% (b) 50% (c) 25% (d) 100%
286. Haemophilia is a condition where there is-
 (a) No production of Haemoglobin in the blood (b) No production of melanin in the skin
 (c) A failure of clotting mechanism blood (d) A delay in clotting of blood

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	b	c	c	d	a	d	d	b	b	d	c	a	c	b	d	c	b	b	a	b
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	c	b	c	a	b	a	c	d	b	c	d	b	b	d	c	c	d	c	c	a
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	d	a	c	b	b	d	c	a	b	b	b	b	b	c	d	a	c	a	d	c
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	b	c	b	c	c	d	c	b	c	a	a	d	b	c	d	a	b	d	c	b
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	d	b	a	b	d	c	c	a	d	c	c	a	d	a	a	d	a	a	c	b
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	a	b	c	d	d	b	a	a	b	a	a	a	a	c	d	b	a	a	a	d
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	c	b	a	d	c	a	b	c	d	a	c	c	d	b	a	b	a	c	b	d
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	b	a	c	b	c	b	d	c	a	b	c	d	d	b	d	b	b	c	c	a
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	b	a	c	c	d	c	c	d	c	a	b	a	d	c	b	d	b	b	b	c
Ques.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
Ans.	a	d	a	c	d	c	c	b	b	c	d	b	b	a	a	b	c	b	a	b
Ques.	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
Ans.	d	b	c	d	c	b	c	a	a	b	c	d	d	d	a	d	c	c	a	
Ques.	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
Ans.	c	c	c	a	a	d	d	c	d	b	c	c	b	c	c	d	a	b	a	d
Ques.	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
Ans.	a	d	a	d	b	d	b	b	b	a	c	b	c	a	a	c	c	d	b	d
Ques.	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
Ans.	a	a	b	b	a	b	d	a	b	d	c	b	b	c	d	b	a	b	d	a
Ques.	281	282	283	284	285	286														
Ans.	d	b	b	d	b	d														

1. What was the finding of Hershey and Chase?
 - (a) The viral infecting agent is RNA.
 - (b) The viral infecting agent is protein.
 - (c) The viral infecting agent is DNA.
 - (d) The T_2 virus has RNA as its genetic material.
2. Hydrogen bonds occur between which of the following constituents of DNA?
 - (a) sugar and base
 - (b) phosphate and base
 - (c) complementary bases
 - (d) phosphate and sugar
3. In 1957, Meselson and Stahl concluded from their studies that
 - (a) DNA replicates conservatively
 - (b) DNA replicates semiconservatively
 - (c) DNA replicates dispersively
 - (d) DNA does not replicate
4. Replication is continuous in
 - (a) the leading strand
 - (b) the lagging strand
 - (c) the strand where okazaki fragments are present
 - (d) both the strands
5. DNA duplication or multiplication is called
 - (a) transcription
 - (b) translation
 - (c) transaction
 - (d) replication.
6. Which one is correct?
 - (a) DNA replication occurs before mitosis, meiosis and amitosis.
 - (b) The polarity of DNA template on which leading strand forms is $3' \rightarrow 5'$.
 - (c) The products of gene may be rRNA, tRNA and mRNA.
 - (d) All of the above
7. A large cluster of ribosomes is called
 - (a) megasome
 - (b) microsome
 - (c) oligosome
 - (d) polyribosome
8. Which of the following RNA polymerase catalyses the formation of transfer RNA in eukaryotes?
 - (a) RNA polymerase I
 - (b) RNA polymerase II
 - (c) RNA polymerase I and II
 - (d) RNA polymerase III
9. Part of DNA which switch their positions are called
 - (a) cistrons
 - (b) transposons
 - (c) exons
 - (d) introns
10. Transcription refers to the
 - (a) transfer of genetic code or sequences of DNA into RNA
 - (b) formation of DNA from RNA
 - (c) formation of protein
 - (d) polymerisation of RNA in cell-free system
11. The transforming substance of pneumococcus in Griffith's experiment was
 - (a) protein
 - (b) RNA
 - (c) DNA
 - (d) polysaccharide
12. Nonsense codon is responsible for
 - (a) elongation of polypeptide chain
 - (b) termination of protein synthesis
 - (c) putting a wrong amino acid
 - (d) hydrolysis of GTP
13. Which one is not applicable in respect of genetic code?
 - (a) Overlapping
 - (b) Redundancy
 - (c) Degeneracy
 - (d) Universality

14. One gene one enzyme hypothesis was proposed by
 (a) Jacob and Monod (b) Watson and Crick (c) Garrod and Jenson (d) Beadle and Tatum
15. Ligase is an enzyme required for
 (a) proofreading (b) joining DNA bits (c) breaking of DNA (d) renaturation of DNA
16. The chain-terminating codon is
 (a) AUG (b) CCC (c) UAG (d) GGG
17. In one strand of DNA the sequence of bases is AAATGGCCCTT, then the complementary sequence of bases on the other side of the strand would be
 (a) ATATGGCCCCA (b) TTTACCGGGAA (c) TTTTGGCCAM (d) TTTTGGCCCCAA
18. In bacterial chromosome
 (a) there is one origin of replication (b) there are multiple sites of replication
 (c) there is no repair of DNA (d) replication is very slow;
19. What is the distance between two base pairs in the double helix model of DNA?
 (a) 0.34nm (b) 34nm (c) 5Å° (d) 10Å°
20. What is a codon?,
 (a) a group of three deoxyribonucleotides (b) a group of three ribonucleotides
 (c) a unit of mutation (d) a group of four ribonucleotides
21. Generally only one strand of DNA is transcribed. This strand is called
 (a) A strand (b) B strand (c) sense strand (d) template strand
22. The chain initiating codon is
 (a) AUG (b) UAG (c) UAA (d) UUA
23. Out of 64 codons how many of them code for amino acids?
 (a) 4 (b) 20 (c) 61 (d) 32
24. The difference in A, B and Z forms of DNA lie in
 (a) base sequences (b) parallelism of chains (c) hydrogen bonding (d) internucleotide distances
25. In 1928 Frederick Griffith showed that the hereditary material can pass from one type of bacteria into another through a process called
 (a) transduction (b) invasion (c) recombination (d) transformation
26. DNA replication requires
 (a) DNA polymerase only (b) DNA ligase only
 (c) RNA polymerase and translocase (d) DNA polymerase and DNA ligase
27. In 1868 DNA was discovered by the Swedish biochemist
 (a) Feulgen (b) Luria (c) Mirsky (d) Friedrich Miescher
28. Which one of the following synthesizes a repressor protein?
 (a) Regulator gene (b) Promoter gene (c) Structural gene (d) Operator gene
29. Which is true according to Chargaff's rule?
 (a) A = C (b) G = T (c) A + G = T + C (d) $\frac{A + T}{C + G} = 1$
30. The terms cistron, recon and muton were proposed by
 (a) Benzer (b) Morgan (c) Lederberg (d) Johansen

31. Enzyme required for transcription is
 (a) DNA polymerase (b) RNA polymerase (c) RNA-ase (d) endonuclease
32. Synthesis of DNA from RNA template occurs in
 (a) reovirus (b) rous sarcoma virus (c) T₂ (d) TMV
33. Watson and Crick proposed the model of DNA structure in
 (a) 1943 (b) 1953 (c) 1963 (d) 1965
34. How many pairs nucleotides are present in one turn of DNA helix?
 (a) 4 (b) 8 (c) 9 (d) 10
35. If in a DNA molecule cytosine is 18%, the percentage of adenine would be
 (a) 18% (b) 32% (c) 36% (d) 64%
36. RNA that picks up specific amino acid from amino acid pool of cytoplasm to carry it to ribosome during protein synthesis is
 (a) mRNA (b) tRNA (c) rRNA (d) gRNA
37. Nucleotide base present in DNA and not in RNA is
 (a) cytosine (b) thymine (c) uracil (d) guanine
38. Information transfer from RNA to DNA is called
 (a) replication (b) reverse transcription (c) translation (d) transcription
39. Initiation of polypeptide chain takes place through
 (a) methionine (b) lysine (c) leucine (d) glycine
40. In operon model, RNA polymerase binds to
 (a) structural gene (b) operator gene (c) promoter gene (d) regulator
41. Isotopes used in proving semiconservative replication of DNA were
 (a) ¹⁴N ¹⁴C (b) ¹⁴N ¹⁵N (c) ¹⁴N ³¹P (d) ¹⁴C ³¹P
42. Bacterial nucleoid has
 (a) one single-stranded DNA (b) one double-stranded DNA
 (c) two single-stranded DNA (d) many double-stranded DNAs
43. Genetic code translates the languages of
 (a) RNA into that of protein (b) RNA into that of DNA
 (c) amino acids into that of RNA (d) protein into that of DNA
44. Regulator gene controls chemical synthesis (operon system) by
 (a) inhibiting substrate enzyme action
 (b) inhibiting transcription of mRNA
 (c) inhibiting passage of mRNA
 (d) inhibiting enzymes
45. DNA is present in
 (a) mitochondria (b) nucleus (c) chloroplast (d) All of these
46. DNA duplex shows
 (a) left handed and parallel coiling (b) left handed and antiparallel coiling
 (c) right handed and parallel coiling (d) right handed and antiparallel coiling
47. Experimental evidence supporting concept of triplet genetic code was first provided by
 (a) Watson (b) Crick (c) Michaelis and Menten (d) Beadle and Tatum

48. The site of tRNA that binds to mRNA is
 (a) codon (b) anticodon (c) 5' end (d) 3' end
49. Triplet codon refers to sequence of three bases on
 (a) tRNA (b) rRNA (c) mRNA (d) all of these
50. The functional unit of gene that specifies synthesis of one polypeptide is
 (a) muton (b) recon (c) cistron (d) codon
51. Which of the following sugars is found in RNA?
 (a) Hexose (b) Fructose (c) Ribose (d) Glucose
52. Nucleic acids are polymers of
 (a) nucleotides (b) nucleosides (c) amino acids (d) nucleoproteins
53. Reverse transcription was discovered by
 (a) Beadle and Tatum (b) Watson and Crick (c) Khorana (d) Temin and Baltimore
54. The flow of information from DNA to mRNA and then to proteins is called
 (a) transcription (b) translation (c) genetic code (d) central dogma
55. Which is required for protein synthesis?
 (a) Initiation codon (b) GTP (c) Peptidyl transferase (d) All of these
56. Circular DNA is found in
 (a) viruses (b) bacteria, chloroplast and mitochondria
 (c) chloroplast and mitochondria alone (d) all of these
57. Okazaki fragments are formed during
 (a) transcription (b) translation (c) replication (d) transduction
58. Termination of polypeptide chain is brought about by
 (a) UUG, UAG and UGA (b) UCG, GCG and ACC (c) UAA, UAG and UGA (d) UUG, UGC and UCA.
59. The process of translation relates to
 (a) DNA synthesis (b) RNA synthesis (c) ribosome synthesis (d) protein synthesis
60. *Escherichia coli* with completely radioactive DNA was allowed to replicate in nonradioactive medium for two generations. Percentage of bacteria with radioactive DNA is
 (a) 12.5% (b) 25% (c) 50% (d) 100%
61. Which of the following is a non-replicating RNA?
 (a) TMV (b) T₂-bacteriophage (c) Pox virus (d) F × 174
62. Genetic material of retrovirus is-
 (a) DNA (b) RNA (c) Both (a) and (b) (d) None of these
63. Protein coat of a virus is called-
 (a) virus (b) capsid (c) capsomeres (d) Cell wall
64. Viruses parasitizing in bacteria are-
 (a) Bacteriophages (b) Phytophages (c) Cyanophages (d) Bacterio-viruses
65. Virioids differ from viruses in-
 (a) Naked DNA molecules
 (b) Naked DNA packaged in viral genera
 (c) Naked RNA molecules
 (d) Naked RNA with protein coat

66. Whose experiments cracked the DNA and discovered unequivocally that a genetic code is in a triplet ?
 (a) Nirenberg and Matthei (b) Margon and Sturtevant (c) Fieshey and chose (d) Beadle and Tatum
67. mRNA directs the building of proteins through a sequence of-
 (a) Axons (b) Intions (c) Codons (d) Anticodon
68. How much of DNA base sequence among humans is same?
 (a) 50% (b) 80% (c) 99.9% (d) 3.4%
69. Tryptophan operon of *E. coli* is
 (a) a repressive system (b) an inducible system (c) an unregulated system (d) monocistronic
70. What is a split gene?
 (a) A gene with a crack in it
 (b) A gene which has no promoter
 (c) A jumping gene
 (d) A gene whose entire sequences are not retained in the mature RNA
71. A gene that takes part in synthesis of polypeptide is
 (a) regulator gene (b) promoter gene (c) operator gene (d) structural gene
72. Genes that are involved in turning on or off the transcription of structural genes are called
 (a) redundant genes (b) operator genes (c) regulator genes (d) polymorphic genes
73. Operator gene of lac-operon is turned on when lactose molecules bind to
 (a) repressor molecule (b) promoter site (c) mRNA (d) regulator gene
74. The end product of a metabolic pathway may bind a repressor to make the latter active enough to bind to the operator, in which case the end-product is called
 (a) inducer (b) accelerator (c) corepressor (d) aporepressor
75. Restriction endonuclease enzymes are used in genetic engineering because they
 (a) are proteolytic enzymes which degrade harmful proteins
 (b) can cut DNA at variable sites
 (c) can cut DNA at specific base sequence
 (d) can join DNA fragments
76. Feed back repression can be seen in
 (a) all operons (b) lac operon (c) tryptophan operon (d) none of these
77. Wild type *Escherichia coli* growing on medium having glucose is transferred to lactose containing medium. Which one of the following change will occur?
 (a) The bacterium stops dividing (b) All operons are induced
 (c) Lac operon is suppressed (d) Lac operon is induced
78. The promoter allows
 (a) binding of DNA polymerase (b) binding of repressor
 (c) binding of RNA polymerase (d) folding of structural genes
79. The smallest gene affected by mutation is
 (a) exon (b) muton (c) cistron (d) recon
80. The external supply of tryptophan in *Escherichia coli* brings about
 (a) switching on of lac operon (b) switching off of lac operon
 (c) switching on of tryptophan operon (d) switching off of tryptophan operon

81. How many structural genes are present in the tryptophan operon?
 (a) two (b) three (c) four (d) five
82. Lac operon and tryptophan operon are the models of gene expression in
 (a) bacteria (b) viruses (c) eukaryotes (d) all of these
83. Pre-mRNA or hnRNA of eukaryotic cell is-
 (a) formed as result of a replication of DNA
 (b) formed due to the transcription of entire length of a gene
 (c) a new species of genetic RNA
 (d) result of transcription of only introns
84. The genes present in host cells and viruses which cause cancer are
 (a) oncogenes (b) proto-oncogenes (c) house-keeping genes (d) reverse transcriptase
85. The transcription of lac operon is controlled by
 (a) promoter (b) only by regulator (c) operator and promoter (d) operator; promoter and regulator
86. The tryptophan operon is transcribed
 (a) when there is plenty of tryptophan in the cell, (b) when there is no tryptophan in the cell
 (c) when lactose is present (d) even without RNA polymerase
87. The lac operon consists of
 (a) one structural gene (b) three structural genes (c) four structural genes (d) five structural genes
88. An operon is a
 (a) cistron (b) protein (c) gene
 (d) group of regulated structural genes which controls related functions
89. In operon model, regulator gene functions as
 (a) repressor (b) regulator (c) inhibitor (d) all of these
90. Introns are part of DNA which
 (a) code for protein synthesis (b) do not code for protein synthesis
 (c) initiate transcription (d) help in joining pieces of DNA
91. Transgenic plants are developed by
 (a) introducing gene mutation (b) introducing foreign genes
 (c) stopping spindle formation (d) introducing chromosomal mutation
92. Viruses possess
 (a) RNA (b) DNA (c) RNA or DNA (d) neither RNA nor DNA
93. In split genes, the coding sequences are called
 (a) introns (b) exons (c) cistrons (d) operons
94. Lac operon is-
 (a) a set of overlapping genes (b) repressible operon
 (c) inducible operon (d) arabinose operon
95. In Escherichia coli, lac operon is induced by
 (a) I-gene (b) promoter gene (c) lactose (d) p-galactosidase

96. Operon model of gene regulation in prokaryotes was proposed by
 (a) Beadle and Tatum (b) Messelson and Stahl (c) Jacob and Monod (d) Wilkins and Franklin
 (c) I-D, II-CJII-AJV-B (d) I-BJI-CJII-AJV-D

97. **Column I**

Column II

I. Operator site	(A) Binding site for RNA polymerase
II. Promoter site	(B) Binding site for repressor molecule
III. Structural gene	(C) Codes for enzyme protein
IV. Regulator gene	(D) Code for repressor molecules

The correct match is

- (a) I- BJI-AJII-CJV-D (b) I-BJI-AJII-DJV-C
 (c) I-DJI-CJII-AJV-B (d) I-BJI-CJII-AJV-D
98. At one point as a cell carried out its day-to-day activities, the nucleotides GAT were paired with the nucleotides CUA. This pairing occurred
 (a) in a double-stranded DNA molecule. (b) during translation.
 (c) during transcription. (d) when an RNA codon paired with a tRNA anticodon

99. **Column I**

Column II

I. S'AUGS'	(A) segment of DNA
II. RNA with introns and Exon	(B) Chromatin
III. Gene	(C) hn-RNA
IV. Nucleosomes	(D) Initiation codon

The correct match is

- (a) I- DJI- BJII-AJV-C (b) I-BJI-AJH-DJV-C
 (c) I-D, II-CJII-AJV-B (d) I-BJI-CJII-AJV-D
100. A particular '____' carry the Information for making a particular polypeptide, but _____ can be used to make any polypeptide.
 (a) gene and ribosome... a tRNA and an mRNA (b) gene and mRNA... a ribosome and a tRNA
 (c) ribosome and mRNA... a gene and a tRNA (d) gene and tRNA... a ribosome and an mRNA

101. For transcription RNA polymerase attaches to the

- (a) regulator (b) cofactor (c) repressor (d) promoter

102. Imagine an error occurring during DNA replication in a cell, so that where there is supposed to be a T in one of the genes there is instead a G. What effect will this probably have on the cell?

- (a) The amino acid sequence of one of its kinds of proteins will be completely changed.
 (b) An amino acid will be missing from each of its kinds of proteins.
 (c) One of its kinds of proteins might contain an incorrect amino acid.
 (d) An amino acid will be missing from one of its kinds of proteins.

103. **Column I**

Column II

I. mRNA	(A) tRNA
II. Anticodon	(B) Codon
III. Semiconservative mode of DNA Replication	(C) Transformation
IV. Griffith	(D) Meselson & Stahl

The correct match is

- (a) I- DJI- BJII-AJV-C (b) I-BJI-AJII-DJV-C
 (c) I-DJI-CJII-A, IV-B (d) I-BJI-CJII-AJV-D

104. DNA-
- A. acts as genetic material in all cellular organisms
 B. was discovered by F. Miescher who named it as "Nuclein".
 C. Is acidic in nature
 D. Cannot be digested by DNAase
- (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C
105. A. At the time of Mendel, the nature of the 'factors' regulating the pattern of inheritance was very clear.
 B. The determination of complete nucleotide sequence of human genome during last 2 decades has set in a new era of genomics.
 C. In double stranded DNA
 D. DNA is acid but DNAase is not enzyme
- (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C
106. A transcription unit in DNA consists of
- A. A promoter B. The structural gene C. A terminator D. None
- (a) A, C (b) B, D (c) D (d) A, B, C
107. **Column I** **Column II**
- | | |
|---|--|
| I. Griffith
II. Hershey and Chase
III. Prokaryotic DNA
IV. Euchromatin | (A) Nucleoid
(B) Active chromatin
(C) Transduction
(D) Transformation |
|---|--|
- The correct match is
- (a) I- B, II- A, III- C, IV- D (b) I- C, II- A, III- D, IV- B
 (c) I- D, II- C, III- A, IV- B (d) I- B, II- C, III- A, IV- D
108. Which of the following is true?
- A. 'Operon hypothesis' was proposed by Jacob and Monod.
 B. 'One gene-one enzyme theory' was proposed by Beadle and Tatum.
 C. 'Southern blotting' is used in DNA fingerprinting.
 D. Uracil bases remain present in DNA.
- (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C
109. DNA replication needs
- (a) RNA primer (b) DNA template (c) dNTPs (d) All are correct
110. Cauliflower mosaic virus has-
- (a) ssRNA (b) ss DNA (c) ds DNA (d) dsRNA
111. Repressor protein is produced by-
- (a) Regulator gene (b) Operator gene (c) Structural gene (d) Promotor gene
112. **Column I** **Column II**
- | | |
|---|---|
| I. Exon
II. Intron
III. Genetic code
IV. DNA package | (A) Noncoding sequence
(B) Nirenberg, Khorana and Mathaei
(C) Nucleosome
(D) Coding sequence |
|---|---|
- The correct match is
- (a) I- B, II- A, III- C, IV- D (b) I- B, II- A, III- D, IV- C
 (c) I- D, II- A, III- B, IV- C (d) I- B, II- C, III- A, IV- D

113. A sequence of three RNA base can function as -
 A. Codon B. gene C. anticodon D. nucleosides
 (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C
114. A. Both DNA and RNA are able to mutate:
 B. RNA being unstable, mutates at a faster rate
 C. RNA is also known to be catalytic, hence reactive
 D. The presence of thymine at place of uracil confers additional stability to tRNA.
 (a) All are correct (b) All are incorrect
 (c) Only A, B and C are correct (d) Only D is correct
115. Protein synthesis involves
 A. transcription B. translation C. transversion D. translation
 (a) A, B (b) A, B, C, D (c) B, C, D (d) A, B, C
116. The structure of DNA is characterized by
 (a) Right-handed double helix & antiparallel strands (b) Right-handed single helix
 (c) Right-handed double helix and parallel strands (d) Left-handed double helix and parallel strands
117. A nucleosome consists of -
 A. RNA B. Protein C. Histone octamer D. 200 bps long DNA
 (a) C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
118. The structures in chromatin seen as 'bead-on string' when viewed under electron microscope are called:
 (a) Nucleotides (b) Nucleosides (c) Histone octamers (d) Nucleosomes
119. In DNA you find which type(s) of bond
 A. Phosphodiester B. Phosphoester C. Hydrogen D. Glycosidic bond
 (a) C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
120. It is nonsense to think that DNA has -
 (a) 4 types of nitrogenous base (NB) (b) 2 types of NB
 (c) 3 types of NB (d) 6 types of NB
121. **Column I** **Column II**
- | | |
|---------------------|----------------------------------|
| I. Termination | (A) Aminoacyl tRNA synthetase |
| II. Translation | (B) Okazaki fragments' |
| III. Transcription | (C) GTP dependent release factor |
| IV. DNA replication | (D) RNA polymerase |
- The correct match is
 (a) I- B, II- A, III- C, IV- D (b) I- C, II- A, III- D, IV- B
 (c) I- D, II- C, III- A, IV- B (d) I- B, II- C, III- A, IV- D
122. Adenosine is
 (a) a nitrogenous base (b) a nucleotide (c) a ribonucleoside (d) a ribonucleotide
123. A. Taylor et al used radioactive thymidine in root tip of *we/a faba* (Broad Bean) and proved that chromosome replicates semiconservatively .
 B. In eukaryotes replication of DNA takes place in S-phase of the cell cycle.
 C. A failure in cell division after DNA replication results into polyploidy.
 D. Crick pointed out that DNA replicates semiconservatively but first proof for it came from the experiment of

Meselson and Stahl who used $^{15}\text{NH}_4\text{Cl}$ in *E. coli*

- (a) All are correct (b) All are incorrect (c) Only D is correct (d) A and D are correct

124. Which one/ones is/are false for DNA replication?

- (a) Ori is a definite region in DNA where replication starts.
 (b) Deoxyribonucleoside triphosphates (dNTPs) serve as substrates as well as source of energy for polymerization.
 (c) Both leading and lagging strands are synthesized in 3' → 5' direction.
 (d) replication of DNA is responsible for continuity of life on earth.

125. In the lac operon the structural genes are switched off when-

- (a) Repressor binds to operator (b) Repressor binds to promoter
 (c) Repressor binds to regulator (d) Repressor binds to inducer

126. DNA replication includes-

- (a) DNA ligase (b) DNA polymerase and ligase
 (c) RNA polymerase (d) All of the above

127. **Column I**

Column II

I. AUG	(A) Jacob and Monod
II. UAA	(B) Transposons
III. Operon model	(C) Chain terminating codon
IV. Jumping gene	(D) Methionine

The correct match is

- (a) I - B, II - A, III - C, IV - D (b) I - B, II - A, III - D, IV - C
 (c) I - D, II - C, III - A, IV - B (d) I - B, II - C, III - A, IV - D

128. Which of the following has single ring structure

- (a) Uracil (b) Thymine (c) Adenine (d) Guanine

129. **Column I**

Column II

I. Genome of ϕ X174 bacteriophage	(A) Ribozyme, RNAase
ii. Purine	(B) 5386 Nucleotides
III. Catalytic RNA	(C) Adenine & Guanine
IV. Any chemical change in DNA	(D) Mutation

The correct match is

- (a) I - D, II - B, III - A, IV - C (b) I - B, II - A, III - D, IV - C
 (c) I - D, II - C, III - A, IV - B (d) I - B, II - C, III - A, IV - D

130. Nature of DNA replication is-

- (a) Semi-conservative (b) Non-conservative (c) Conservative (d) Dispersive

131. Semi-conservative mode of DNA replication was first reported in *E. coli* with the help of N^{15} heavy nitrogen by-

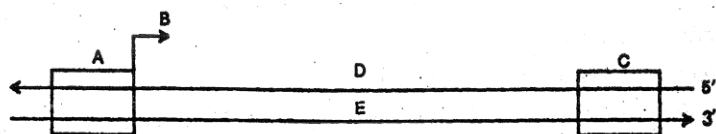
- (a) Kornberg and Ochoa (b) Limia and Delbruck (c) Meselson and Stahl (d) Watson and Crick

132. **Column I** **Column II**
- I. Splicing
II. Okazaki fragments
III. Jacob and Monad
IV. Inducer
The correct match is
(a) I- DJI- BJII-AJV-C
(c) I-DJI-C, III-A, IV-B
- (A) Lacoperon
(B) lagging strands
(C) Lactose
(D) removals of intron
(b) I-BJI-AJII-DJV-C
(d) I-BJI-CJII-AJV-
133. Intron is -
A. coding sequence
C. Character of Prokaryotic genome
- B. Non-coding sequence
D. Character of eukaryotic genome
134. **Column I** **Column II**
- | | |
|------------------------|----------------------------|
| I. Helicase | (A) Joining of nucleotides |
| II. Gyrase | (B) Opening of DNA |
| III. Primase | (C) Unwinding of DNA |
| IV. DNA polymerase III | (D) RNA priming |
- The correct match is
(a) I- B.II- A,III-C,IV-D
(c) I-D,II-C, III-A.IV-B
- (b) I-B.II-A.III-D.IV-C
(d) (dH-B.II-C.III-D, IV-A
135. In chromosome, DNA is associated with -
A. Negatively charged proteins
C. Neutral proteins
(a) B,D (b) A,B,C, D
- B. Positively charged proteins
D. NHC protein
(c) B, C, D (d) A, B, C
136. Heterochromatin -
A. Is more densely packed
C. Is transcriptionally active
(a) A,C (b) A, B,C,D
- B. Is stains dark
D. Is transcriptionally inactive
(c) B,C,D (d) A, B,D
137. DNA replication -
A. is semiconservative
C. takes place in 5' → 3' direction.
(a) B,D (b) A,B,C,D
- B. Is bidirectional
D. is semidiscontinuous
(c) B, C, D (d) A, B, C
138. Which one of the following triplet code is correctly matched with its specificity for an amino acid in protein synthesis or as start or 'stop' signal-
(a) uuu-stop (b) uau-Leucine (c) uAg-Tyrosine (d) uca-start
139. The difference(s) between mRNA and tRNA is/ are that -
A. mRNA has more elaborated 3-dimensional structure due to extensive base-pairing
B. tRNA has more elaborated 3-dimensional structure due to extensive pairing.
C. tRNA is usually smaller than mRNA
D. mRNA bears anticodon but tRNA has codons.
(a) A,C (b) A,B,C,D (c) B, C (d) A,B,C

140. Genetic code consists of -
 A. adenine and guanine B. riboflavin and ATP C. cytosine and guanine D. cytosine and uracil
 (a) A, C, D (b) A, D (c) B, C, D (d) A, B, C
141. A ribotide is made up of -
 (a) Adenine + Deoxyribose + Phosphate (b) Cytosine + Ribose + Phosphate
 (c) Thymine + Ribose + Phosphate (d) Cytosine + Deoxyribose + Phosphate
142. Which one / ones did not affect the transformation?
 A. DNAase B. RNAase C. Peptidase D. Lipase
 (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C
143. Euchromatin is -
 A. loosely packed B. Stains light C. Transcriptionally active D. Early replicating
 (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C
144. DNA polymerase -
 A. is the main enzyme for RNA synthesis B. Is DNA dependent DNA polymerising hormone
 C. Is highly efficient enzyme D. Is catalyses reaction with high degree of accuracy.
 (a) C, D (b) A, B, C, D (c) B, C, D (d) A, B, C
145. Antiparallel relationship of the two strands of DNA refers to the -
 (a) Strands being the opposite of parallel - they are twisted.
 (b) Strands providing alternate branching
 (c) One strand runs in 5' → 3' and other in 3' → 5' direction
 (d) Both strands run in 5' → 3' direction
146. DNA repairing is done by -
 (a) Ligase (b) DNA polymerase I (c) DNA polymerase II (d) Both (a) and (b)
147. DNA is a double helix and -
 (a) Complementary and parallel (b) Complementary and antiparallel
 (c) Without supercoils (d) Always circular
148. Anticodon is present in -
 (a) rRNA (b) tRNA (c) mRNA (d) mtRNA
149. Which of the following makes use of RNA as a template to synthesise DNA?
 (a) Reverse transcriptase (b) DNA dependent RNA polymerase
 (c) DNA polymerase (d) RNA polymerase
150. The phosphodiester bonds between nucleotides are called -
 (a) Backbone of DNA (b) Steps of DNA (c) Imidazole (d) Hydrophobic attraction
151. In 1953 James Watson and F. Crick proposed Double Helix model of DNA and got Nobel Prize for their model of DNA was based on -
 A. X-ray diffraction of DNA produced by M. Wilkins and R. Franklin
 B. Griffith's experiment.
 C. Hershey - Chase experiment
 D. Chargaff's rule of base equivalence ($A + G / T + C = 1$)
 (a) A, D (b) A, B, C, D (c) B, C, D (d) A, B, C

152. In one polynucleotide chain of a DNA molecule the ratio of $A + T / G + C$ is 0.3. What is the $A + G / T + C$ ratio of the entire DNA molecule
 (a) 0.3 (b) 0.6 (c) 1.2 (d) 1
153. Nucleic acids are made up of
 A. nitrogenous bases B. amino acids C. sugar D. phosphate
 (a) A, C, D (b) A, D (c) B, C, D (d) A, B, C
154. E-coli about to replicate was placed in a medium containing radioactive thymidine for 5 minutes. Then it was made to replicate in a normal medium. Which of the following observations will be correct-
 (a) Both the strands of DNA will be radioactive (b) One strand radioactive
 (c) Each strand half radioactive (d) None of radioactive
155. The chemical knives of DNA are-
 (a) Ligases (b) Polymerases (c) Endonucleases (d) Transcriptase's
156. DNA is methylated at-
 (a) A-residue (b) G-residue (c) T-residue (d) C-residue
157. Polymorphism in DNA sequence
 A. is the basis of genetic mapping of human genome B. arises due to mutation
 C. is the basis of DNA finger printing D. None
 (a) A, C (b) A, B (c) D (d) A, B, C
158. In human-
 A. Non-coding DNA is the most abundant.
 B. The function of more than 50% discovered genes are unknown.
 C. Less than 2% of genome codes for protein
 D. Total number of genes is 30,000.
 (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C
159. The human genome consists of over _____ base pairs
 (a) 1 million (b) 3 billion (c) 46 billion (d) 3.6 million
160. A. In eukaryotes there are atleast three RNA polymerase
 B. Hn RNA has both exons and introns
 C. Hn RNA is formed in both prokaryotes and eukaryotes
 D. Any mistake in DNA replication may cause mutation.
 (a) All are correct (b) All are incorrect (c) Except C, all are correct (d) Only D is correct
161. Satellite DNA
 A. Is classified in many categories such as micro-satellites, minisatellites, etc on the basis of base composition length of segments and number of repetitive units.
 B. Normally does not code for any protein
 C. Shows polymorphism
 D. Forms the basis of DNA finger printing.
 (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C

162. Following is the schematic structure of transcription unit having some important components indicated by A, B, C, D and E. In which of four option the components are identified correctly -

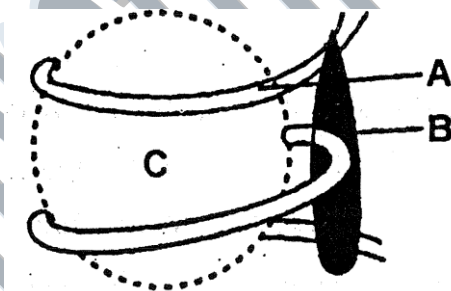


A	B	C	D	E
(a) Terminator	Transcription start site	Promoter	Template strand	Coding strand
(b) Promoter	Transcription start site	Terminator	Coding strand	Template strand
(c) Promoter	Transcription start site	Terminator	Template strand	Coding strand
(d) Terminator	Transcription start site	Promoter	Coding strand	Template strand

163. The experimental proof for DNA as genetic material comes from

A. transformation	B. transduction	C. conjugation	D. mutation
(a) A, C	(b) A, B, C, D	(c) C, D	(d) A, B

164. Go through the following diagram of Nucleosome (structural unit of chromatin). Identify its componental parts indicated by A, B and C-



A	B	C
(a) RNA	Non histone	Histone
(b) DNA	H1 histone	Histone Octamer
(c) RNA	Histone Octamer	H1 histone
(d) DNA	Non histone	Histone

165. Nucleosome contains

A. RNA	B. DNA	C. histones	D. all of these
(a) A, C	(b) A, B, C, D	(c) B, C	(d) A, B, C

166. The current estimate of the number of genes in the human -

(a) Is based on the number of genes in the fruitfly	(b) Has not changed from previous estimate
(c) Has increased greatly from previous estimate	(d) Has decreased greatly from previous estimates.

167. In prokaryotes, gene regulation occurs at the level of-

(a) Transcription	(b) Translation	(c) Post transcription	(d) Post translation
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168. Transcription is most similar to -

(a) Chemiosmosis	(b) DNA replication	(c) Translation	(d) Transposition
------------------	---------------------	-----------------	-------------------

169. In eukaryotes the gene expression is regulated at-

A. Transcriptional level	B. Processing level
C. Transport of mRNA from nucleus to the cytoplasm	D. Translation^ level
(a) A, C	(b) A, B, C, D
	(c) B, C, D
	(d) A, B, C

170. Characteristic(s) of most DNA is/are
- | | |
|--|---|
| A. A pairs with T by 2 hydrogen bonds. | B. Antipolarity of complementary chains |
| C. 20 Å diameter | D. 10 bps/turn |
| (a) A, C | (b) A, B, C, D |
| (c) B, C, D | (d) A, B, C |
171. Which of the following statements is/are incorrect about tRNA?
- | | |
|---|--|
| A. It binds to DNA, initiating translation | B. It has a greater molecular weight than mRNA |
| (X) It transfers the code from the nucleus to cytoplasm | D. There is at least one form for each kind of amino acid. |
| (a) A, C | (b) A, B, C, D |
| (c) B, C, D | (d) A, B, C |
172. Which of the following is/are correct matching(s)
- | | |
|-------------|----------------|
| Codon | Amino acid |
| A. 'AGU' | Serine |
| B. 'UAC' | Tyrosine |
| C. 'AUG' | Methionine |
| D. 'GUG' | Valine |
| (a) A, C | (b) A, B, C, D |
| (c) B, C, D | (d) A, B, C |
173. Transcription needs -
- | | | | |
|-----------------|----------------|-------------------|------------------------|
| A. DNA template | B. NTPs | C. RNA polymerase | D. Sigma & Rho factors |
| (a) A, C | (b) A, B, C, D | (c) B, C, D | (d) A, B, C |
174. The function of the promoter is to signal RNA polymerase as to -
- | | |
|---------------------------------------|--|
| A. where to stop transcribing the DNA | B. where to start transcribing the DNA |
| C. which strand of the DNA to be read | D. None |
| (a) B, C | (b) A, B, C, D |
| (c) B, C, D | (d) A, B, C |
175. Termination of protein synthesis needs
- | | |
|----------------------------------|-------------------------------|
| A. 6' AUG codon | B. 3' UAG codon |
| C. Stop signal / Non-sense codon | D. Release/termination factor |
| (a) A, C | (b) A, B, C, D |
| (c) C, D | (d) A, B, C |
176. A translational unit in mRNA includes-
- | | |
|-------------------------------|---|
| A. Start codon | B. Stop codon |
| C. Untranslated regions (UTR) | D. Coding sequence is located between the start codon and termination codon |
| (a) A, C | (b) A, B, C, D |
| (c) B, C, D | (d) A, B, C |
177. Which one is nonsense codon?
- | | | | |
|----------|----------------|-------------|-------------|
| A. UUA | B. UAA | C. UAG | D. UGA |
| (a) A, C | (b) A, B, C, D | (c) B, C, D | (d) A, B, C |
178. Split genes include
- | | | | |
|----------------|----------------|----------|-------------|
| A. pseudogenes | B. transposons | C. exons | D. introns |
| (a) A, C | (b) A, B, C, D | (c) C, D | (d) A, B, C |

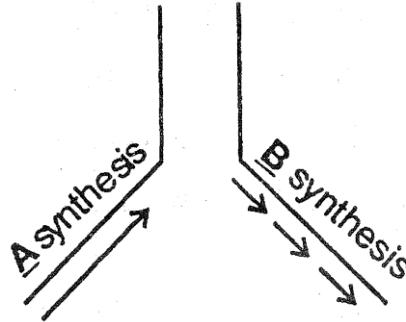
179. Complete the central dogma of molecular basis of inheritance (by Crick) -



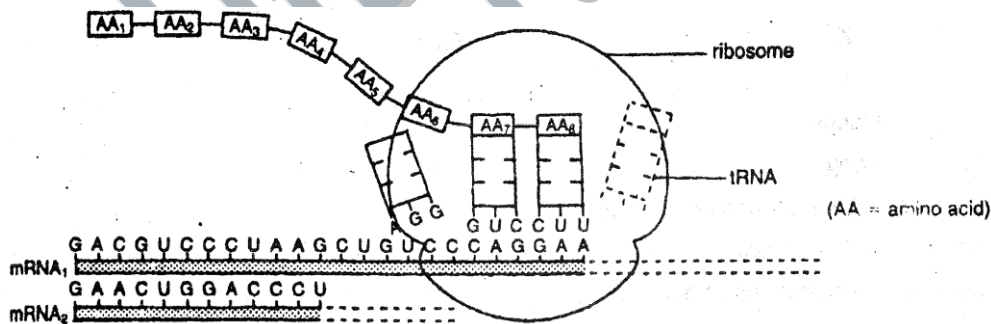
- (a) A- Replication, B -Transcription, C - Translation (b) A- Replication, B - Termination, C -Translation
 (c) A - Replication, B - Translocation, C - Translation (d) A - Replication, B - Transposition, C – Translation
180. Which one is correct?
- A. DNA cannot produce its copies without DNA polymerase.
 B. DNA cannot produce RNA.
 C. RNA can produce complementary DNA / cDNA
 D. DNA helps in protein synthesis
- (a)A,C,D (b)A, B, C, D (c) B, C, D (d)A,B,C
181. A cell is grown in a solution containing radioactive nucleotides, so that its DNA is labeled with radioactivity. It is removed from the radioactive solution and grown in a normal medium, so that any new DNA strands it makes will not be radioactive. In the normal medium, the cell replicates its DNA and divides. The two daughter cells also replicate their DNA and divide, producing a total of four cells. If a dotted line represents a radioactive DNA strand and a solid line represents a nonradioactive DNA strand, which of the following depicts the DNA of the four cells?
- (a)
- (b)
- (c)
- (d)
182. Certain molecular processes are given in column A. Provide the terms given to these processes in column B after selecting them from terms : recombination, gene regulation, prokaryotic transcription, eukaryotic transcription, translation, replication, gene transfer, DNA finger printing.
- | Column A | Column B |
|-----------------------------------|----------|
| (i)DNA ——— »DNA | |
| (ii)DNA- ——— ->hnRNA | |
| (Sii)mRNA ——— • — > Protein | |
| (iv) Represser protein + Operator | |
- No transcription
- (a) (i) - Replication, (ii) Transcription, (iii) Translation, (iv) Gene regulation
 (b) (i) - Replication, (ii) Gene transport, (iii) Translation, (iv) Gene regulation
 (c) (i) - Replication, (ii) Transcription, (iii) Gene regulation, (iv) Translation
 (d) (i) - Replication, (ii) DNA finger printing, (iii) Translation, (iv) Gene regulation
183. Genetic code is
- A. triplet B. degenerate C. nonambiguous D. universal
 (a) A, C (b)A,B,C,D (c) B, C, D (d)A,B,C

184. Which of the following statements is correct about Human Genome Project -
- To develop ways of mapping the human genome at increasing fine level of precision
 - To store this information in databases and develop tools for data analysis
 - To address the ethical, legal and social issue that may arise from this project
 - All of the above

185. Name the types of synthesis A and B occurring in the replication fork of DNA as shown below:

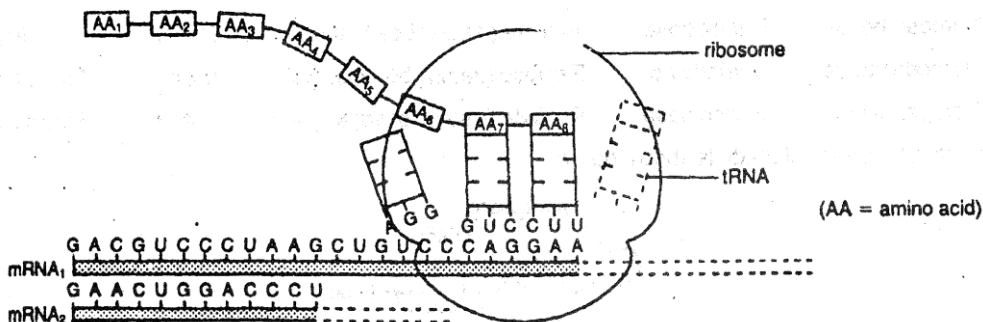


- A- Continuous synthesis (synthesis of leading strand); B - Discontinuous synthesis (Synthesis of lagging strand).
 - A- Discontinuous synthesis (synthesis of leading strand); B - Continuous synthesis (Synthesis of lagging strand).
 - A- Continuous synthesis (synthesis of lagging strand); B - Discontinuous synthesis (Synthesis of leading strand).
 - A - Discontinuous synthesis (synthesis of lagging strand); B - Continuous synthesis (Synthesis of leading strand).
186. Refer to the following diagram which shows the synthesis of part of a protein molecule.



The DNA strand from which mRNA₁ was synthesised is-

- GAACTGGACCCT
 - CTTGACCTGGGA
 - GMCUGGACCCU
 - CUUGACCUGGGA
187. Refer to the following diagram which shows the synthesis of part of a protein molecule.



Which of the following is the first part of the protein molecule that would be translated from mRNA₂? start of protein

- ↓
- (a) $AA_4 - AA_2 - AA_7 - AA_6$
- (b) $AA_6 - AA_7 - AA_2 - AA_4$
- (c) $AA_3 - AA_1 - AA_5 - AA_8$
- (d) $AA_8 - AA_6 - AA_1 - AA_3$

188. Given below are two statements (A and B) each with some blanks. Select the option which correctly fills up the blanks in the statements :

Statements:

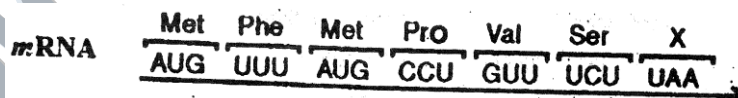
A. The ribosome consists of structural ____ and about 80 different _____. In its inactive state, it exists as ____ subunits. There are two sites in the large subunit, for subsequent amino acids to bind to and thus, be close enough to each other for the formation of a _____ bond. The ribosome also acts as a catalyst (23S rRNA in bacteria is the enzyme _____) for the formation of peptide bond.

B. A translational unit in _____ is the sequence of RNA that is flanked by the start codon (AUG) and the stop codon and codes for a polypeptide. An mRNA also has some additional sequences that are not translated and are referred as **untranslated regions (UTR)**. The UTRs are present at both 5'-end (before start codon) and at 3'-end (after stop codon). They are required for efficient _____ process.

Options:

- (a) A - (i) RNAs, (ii) proteins, (iii) two, (iv) peptide, (v) ribozyme B - (i) mRNA, (ii) translation
- (b) A - (i) proteins, (ii) RNAs, (iii) two, (iv) peptide, (v) ribozyme B - (i) mRNA, (ii) translation
- (c) A - (i) RNAs, (ii) proteins, (iii) two, (iv) peptide, (v) ribozyme B - (i) mRNA, (ii) transcription
- (d) A - (i) RNAs, (ii) proteins, (iii) two, (iv) peptide, (v) cytozyme B - (i) mRNA, (ii) translation

189. Read the sequence of the nucleotides in the given segment of mRNA and the respective amino acid sequence in the polypeptide chain.



Polypeptide Met—Phe—Met—Pro—Val—Ser

- (i) Triplet bases (codons) for (a) Valine (b) Proline, _____
- (ii) Nucleotide sequence of the DNA strand from which this mRNA was transcribed.
- (iii) Last codon of this RNA stand for.

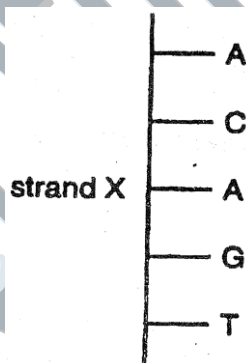
The correct answer to the question (i), (ii) and (iii) are

- (a) (i) Valine. GUU Proline. CCU, (ii) TAG AAATAC GGACAAAGAATT, (iii) Stop.
- (b) (i) Valine. GGU Proline. CCU, (ii) TAG AAATAC GGA CAAAGAATT, (iii) Stop.
- (c) (i) Valine. GUU Proline. CCC, (ii) TAG AAATAC GGA CAA AGA ATT, (iii) Stop.
- (d) (i) Valine. GUU Proline. CCU, (ii) ATG TTTATG CCT GTTTCTTAA, (iii) Stop.

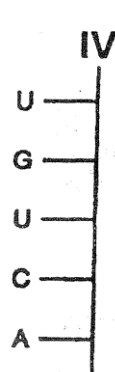
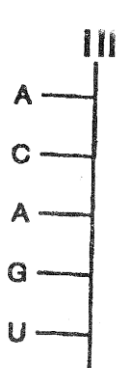
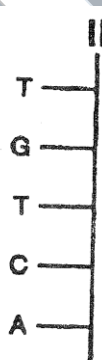
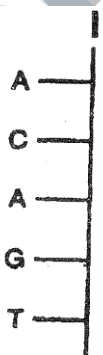
190. The fact that the genetic code is almost universal in living organisms is considered to be evidence that all organisms

- (a) are evolutionarily related (b) are genetically identical
- (c) have the same sequence of anticodons (d) none of the above

191. Circular DNA is found in
 A. viruses B. bacteria C. mitochondria D. chloroplasts
 (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C
192. Similarity between DNA and RNA is that both have
 A. adenine B. guanine C. thymine D. cytosine
 (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, D
193. DNA replication involves
 A. unwinding of helix B. transcription C. formation of primer strand D. translation
 (a) A, C (b) A, B, C, D (c) B, C, D (d) A, B, C
194. A free transfer RNA molecule can combine with
 (a) one specific amino acid only, (b) any available amino acid,
 (c) three different amino acids. (d) a chain of amino acids.
195. A mRNA template is
 (a) translated from protein, (b) transcribed into protein (c) translated in DNA (d) transcribed from DNA.
196. Strand X in the diagram shows a small part of a nucleic acid molecule.

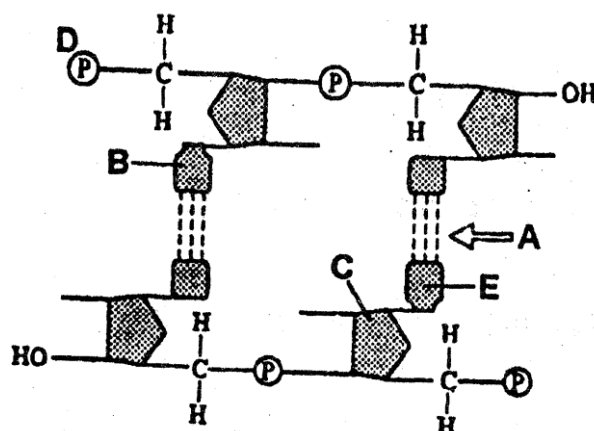


Which pair of the following strands are complementary to strand X?



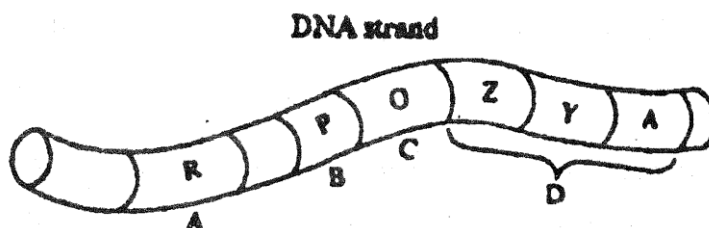
- (a) I and III (b) II and IV (c) I and II (d) III and IV
197. Listed below are the stages in the cellular synthesis of a protein.
 1 movement of mRNA from nucleus to cytoplasm
 2 linking of adjacent amino acid molecules
 3 transcription of mRNA from a DNA template
 4 formation of the polypeptide chain
 5 attachment of the mRNA strand to a ribosome.
 In which order do these stages take place?
 (a) 13254 (b) 15342 (c) 31524 (d) 34125

198. The following diagram is the polynucleotide chain. Identify A, B, C, D and E.



A	B	C	D	E
(a) Hydrogen bonds	Pyrimidine	Hexose (deoxyribose) sugar	5' end	Purine base
(b) Hydrogen bonds	Purine base	Hexose (deoxyribose) sugar	5' end	Pyrimidine
(c) Hydrogen bonds	Pyrimidine	Pentose (deoxyribose) sugar	5' end	Purine base
(d) Hydrogen bonds	Purine base	Pentose (deoxyribose) sugar	5' end	Pyrimidine

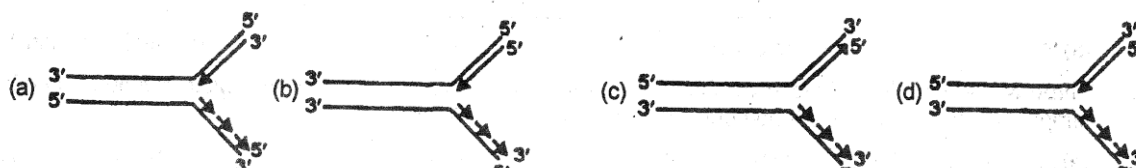
199. The diagram of the lac operon from *E. coli* is shown below. Each letter indicates its components may be used more



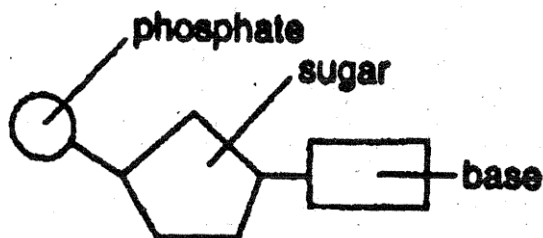
Which of the following option is correct in respect of the letters and their functions -

- (a) C - the binding site for the repressor protein, B - the binding site for RNA polymerase, D - the structural genes, A - the gene that codes for the repressor protein.
- (b) A - the binding site for the repressor protein, B - the binding site for RNA polymerase, C - the structural genes, D - the gene that codes for the repressor protein.
- (c) A - the binding site for the repressor protein, D - the binding site for RNA polymerase, B - the structural genes, C - the gene that codes for the repressor protein.
- (d) D - the binding site for the repressor protein, C - the binding site for RNA polymerase, B - the structural genes, A - the gene that codes for the repressor protein.

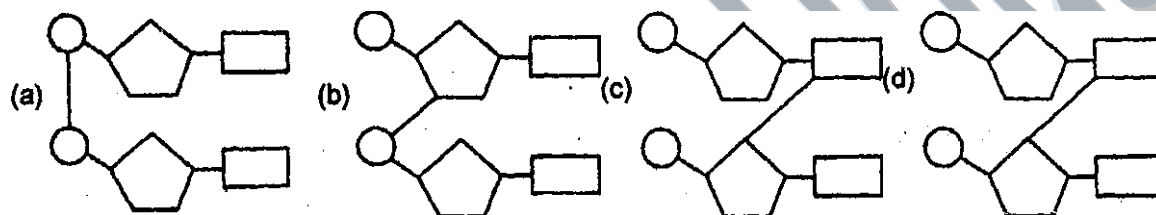
200. Which one of the following correctly represents the manner of replication of DNA?



201. The structure of one nucleotide is shown below.



Which of the following diagrams shows two nucleotides correctly joined together?



202. Using code dictionary select the option which correctly fills up the blanks in the following table.

DNA triplet 3' → 5'	mRNA Codon 5' → 3'	Anticodon	Amino Acid
.....	.....	.....	methionine
.....	.....	GGA	.....
TTC	.....	.....	.....
.....	UAG	.....	.....

(a)

DNA triplet 3' → 5'	mRNA codon 5' → 3'	Anticodon	Amino acid
TAC	AUG	UAC	methionine
GGA	CCU	GGA	proline
TTC	AAG	UUC	lysine
ATC	UAG	AUC	stop

(b)

DNA triplet 3' → 5'	mRNA codon 5' → 3'	Anticodon	Amino acid
AUG	TAC	UAC	methionine
GGA	CCU	GGA	proline
TTC	AAG	UUC	lysine
ATC	UAG	AUC	stop

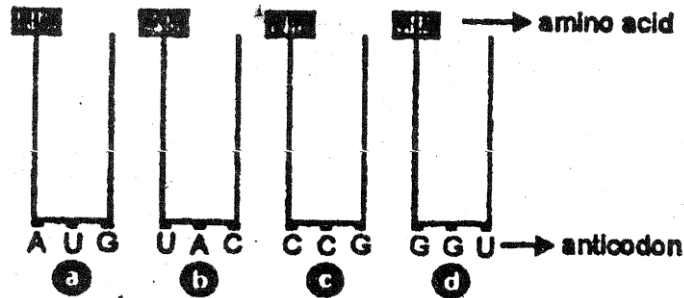
(c)

DNA triplet 3' → 5'	mRNA codon 5' → 3'	Anticodon	Amino acid
TAC	AUG	UAC	methionine
GGA	CCU	GGA	proline
AAG	ATC	UUC	lysine
TTC	UAG	AUC	stop

(d)

DNA triplet 3' → 5'	mRNA codon 5' → 3'	Anticodon	Amino acid
TAC	AUG	UAC	methionine
GGA	CCU	GGA	proline
TTC	AAG	UUC	lysine
ATC	UAG	AUC	histidine

203. Find the sequence of binding of the following amino acyl-t RNA complexes during translation to a m-RNA transcribed by a DNA segment having the base sequence 3'TACATGGGTCCG5'.



Choose the answer showing, the correct order of alphabets.

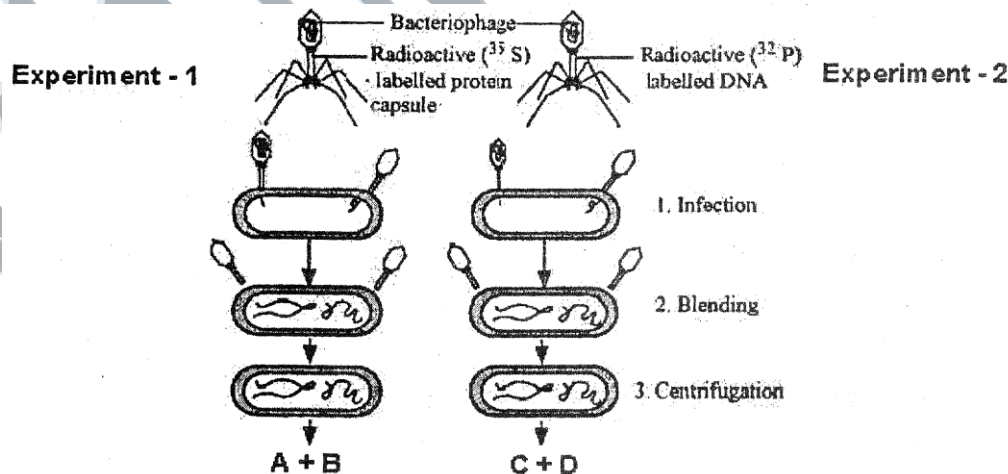
- (a) a,b,c,d (b) b,a,c, d (c) a, b, d, c (d) b,a,d,c

204. The diagram represents part of a DNA molecule.

What would be the appearance after semi-conservative replication had occurred?

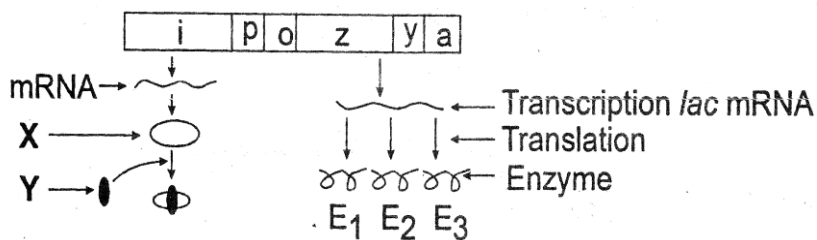
<p>A—T T—A</p> <p>C—G G—C</p> <p>C—G G—C</p> <p>T—A A—T</p> <p>(a) G—C C—G</p> <p>C—G G—C</p> <p>T—A A—T</p>	<p>A—T—U</p> <p>C—G—C</p> <p>C—G—C</p> <p>T—A—T</p> <p>(b) G—C—G</p> <p>C—G—C</p> <p>T—A—T</p>	<p>U—</p> <p>G—</p> <p>G—</p> <p>A—</p> <p>(c) C—</p> <p>G—</p> <p>A—</p>	<p>A—</p> <p>C—</p> <p>C—</p> <p>T—</p> <p>(d) G—</p> <p>C—</p> <p>T—</p>	<p>A—T</p> <p>C—G</p> <p>C—G</p> <p>T—A</p> <p>G—C</p> <p>C—G</p> <p>T—A</p>
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205. Alfred Hershey and Martha Chase made a big contribution in proving DNA role as the hereditary molecule. The experiment is shown in the diagram. A and C are the presence or absence of radioactivity detected in cells B and D are the presence or absence of radioactivity detected in supernatants cells, identify A, B, C and D –



- (a) A - No Radioactivity (^{35}S) detected in cells; B - Radioactivity (^{32}P) detected in supernatant; C - Radioactivity (^{35}S) detected in cells; D - No Radioactivity in supernatant
- (b) A- Radioactivity (^{35}S) detected in cells; B ~ No Radioactivity (^{35}S) detected in supernatant; C - Radioactivity (^{32}P) detected in cells; D - No Radioactivity in supernatant
- (c) A - No Radioactivity (^{35}S) detected in cells; B - Radioactivity (^{35}S) detected in supernatant; C - Radioactivity (^{32}P) detected in cells; D - No Radioactivity in supernatant
- (d) A- No Radioactivity (^{35}S) detected in cells; B - Radioactivity (^{35}S) detected in supernatant; C - No Radioactivity (^{32}P) detected in cells; D - Radioactivity in supernatant

206. In the following diagram of the *lac* operon, an operon for inducible enzymes, Identify components and enzymes -



X	Y	E_1	E_2	E_3
(a) Repressor protein	Inducer (lactose)	β -Galactosidase	Permease	Transacetylase
(b) Inducer (lactose)	Repressor protein	β -Galactosidase	Permease	Transacetylase
(c) Repressor protein	Inducer (lactose)	β -Galactosidase	Transacetylase	Permease
(d) Repressor protein	Inducer (lactose)	Permease	Transacetylase	β -Galactosidase

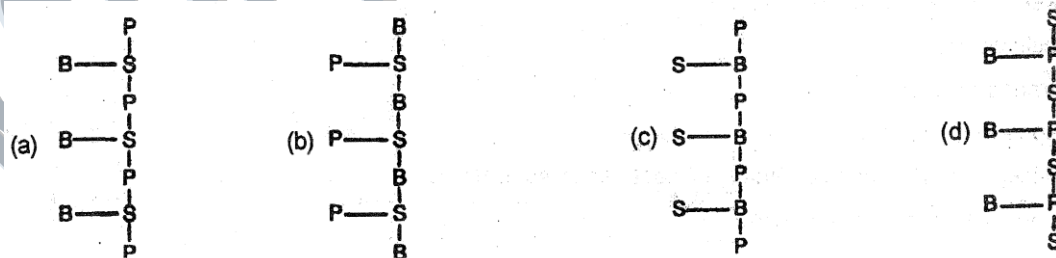
207. The following events occur in the replication of DNA:

- 1 bonds between complementary bases break
 - 2 bonds between complementary bases form
 - 3 DNA molecule uncoils
 - 4 opposite strands separate
 - 5 sugar-phosphate bonds form
 - 6 free nucleotides join with complementary nucleotides on each strand
- In which order do these events take place?

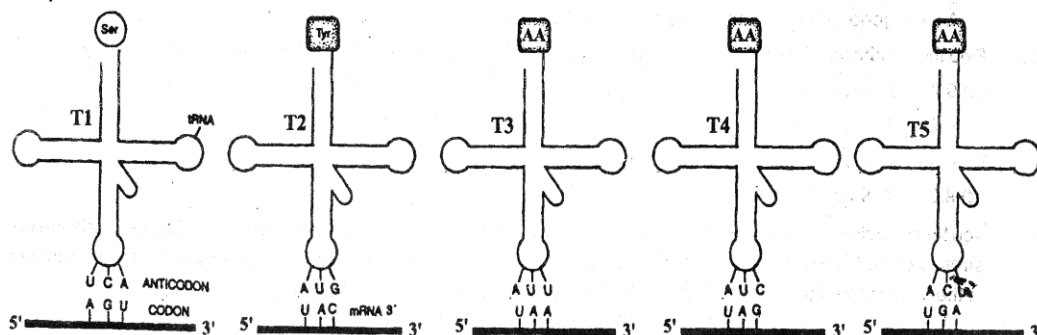
- (a) 136425 (b) 3 1 4 6 2 5
(c) 3 6 1 4 5 2 (d) 4 3 1 6 5 2

208. A shorthand method of representing part of a single strand of DNA is shown opposite.

Which of the following shows the correct positions of the phosphate (P), sugar (S) and base (B) molecules?

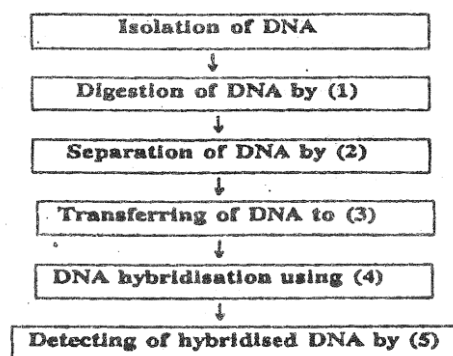


209. Observe the following tRNA molecules with their anticodon pairing with respective codons. Which types of tRNA is not possible-



- (a) T1 and T2 (b) T1, T2 and T3 (c) T1 and T4 (d) T3, T4 and T5

210. Complete the accompanying flow chart of DNA finger printing.



(a) 1 - Restriction endonuclease; 2 - Electrophoresis; 3 - Nitrocellulose or nylon; 4 - Labelled VNTR probe; 5 -Autoradiography

(b) 1 - Electrophoresis; 2 - Restriction endonuclease; 3 - Nitrocellulose or nylon; 4 - Labelled VNTR probe; 5 -Autoradiography

(c) 1 - Restriction endonuclease; 2 - Electrophoresis; 3 - Labelled VNTR probe; 4 - Nitrocellulose or nylon; 5 -Autoradiography

(d) 1 - Restriction endonuclease; 2 - Electrophoresis; 3 - Nitrocellulose or nylon; 4 - Autoradiography; 5 - Labelled VNTR probe

211. Three types of RNA involved in comprising the structural and functional core for protein synthesis, serving as a template for translation, and transporting amino acid, respectively, are-

(a) mRNA, tRNA, rRNA (b) rRNA, tRNA, mRNA (c) tRNA, mRNA, rRNA (d) rRNA, mRNA, tRNA

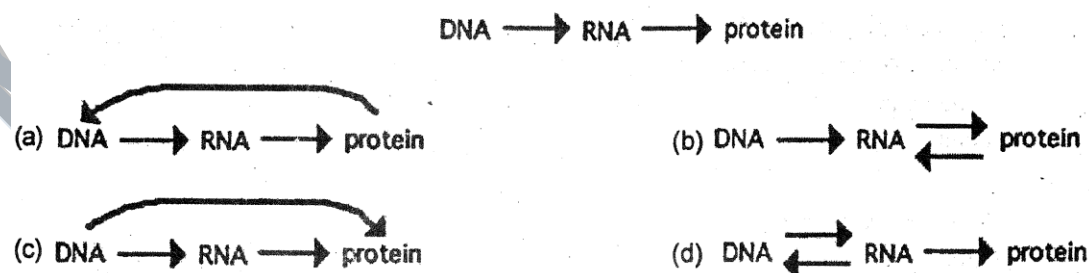
212. Avery, MacLeod and McCarty used the S (virulent) and R (avirulent) strains of *D. pneumoniae*. They isolated and purified proteins, DNA, RNA, carbohydrates and lipids from the S strain. They treated the living avirulent R strain with each of these chemicals and identify the transforming principle (DNA).

R-type + Protein S-type	→	.....A - type.....
R-type + Carbohydrate S-type	→	.....B - type.....
R-type + (DNA of S-type + DNase)	→	.....C - type.....
R-type + DNA of S-type	→	.....D - type.....

Identify the type of bacteria (A to D) -

	A - type	B - type	C - type	D - type
(a)	R + S	R + S	R + S	S
(b)	R + S	S	R + S	R
(c)	S	S	S	R
(d)	R	R	R	S

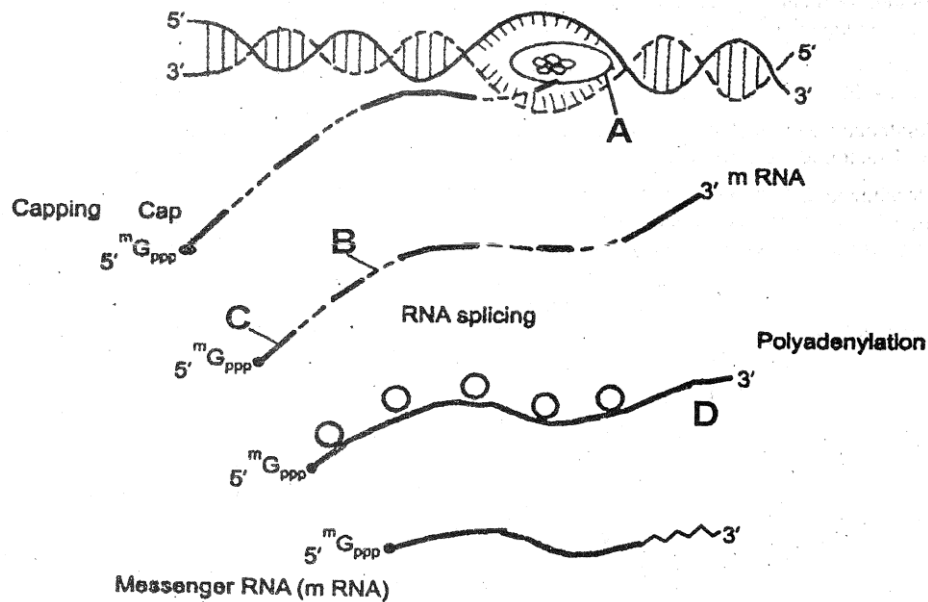
213. The discovery of retroviruses and their mechanism of replication required scientists to rethink the "Central Dogma" of molecular biology. What diagram would represent an appropriate adjustment to this Central Dogma diagram?



214. Frederick Griffith conducted experiments testing the virulence of two strains of *Streptococcus* (R-strain and S-strain). His experiment had four specific "treatments" to it. Treatment 1, he injected mice with the R-strain and the mice lived. Treatment 2, he injected mice with the S-strain and the mice died. Treatment 3, he injected mice with heat-killed S-strain and the mice lived. Treatment 4, he injected mice with heat-killed S-strain mixed with R-strain and the mice died. Which treatment in his experiment is considered the experimental treatment?

(a) Treatment 3 is the experimental treatment (b) Treatments 1 and 2 are experimental treatments,
(c) Treatment 1 is the experimental treatment. (d) Treatments 3 and 4 are the experimental treatments.

215. The following diagram refers to the process of transcription in Eukaryotes. Identify A, B, C and D -



Messenger RNA (m RNA)

- (a) A - RNA polymerase II, B - Exon, C - Intron, D - Poly A tail
 (b) A- DNA polymerase II, B - Intron, C - Exon, D - Poly A tail
 (c) A - RNA polymerase II, B - Intron, C - Exon, D - Poly A tail
 (d) A- RNAPolymerase II, B - Intron, C - Exon, D - Poly G tail
216. The following diagram refers to Griffith's demonstration of transformation in pneumococcus. A, B, C and D indicate the fates of mice after they are injected with specific bacteria. Identify these fate of mice.
- | | | | | |
|--|---|--------------------|---|-------------|
| S strain | → | Inject into mice | → |A..... |
| R strain | → | Inject into mice | → |B..... |
| S strain (heat killed) | → | Injected into mice | → |C..... |
| S strain (heat-killed) + R strain | → | Inject into mice | → |D..... |
- (a) A - dies, B-dies, C-lives, D-lives
 (b) A - lives, B -lives, C - dies, D -dies
 (c) A - dies, B - lives, C - lives, D - dies
 (d) A - lives, B - dies, C - dies, D - lives
217. Frederick Griffith conducted experiments testing the virulence of two strains of *Streptococcus* (R-strain and S-strain). His experiment had 4 specific "treatments" to it
- Treatment 1, he injected mice with the R-strain and the mice lived.
 Treatment 2, he injected mice with the S-strain and the mice died.
 Treatment 3, he injected mice with heat-killed S-strain and the mice lived.
 Treatment 4, he injected mice with heat-killed S-strain mixed with R-strain and the mice died.
- Which treatment in his experiment is considered a control treatment?
- (a) Treatment 3 is the control treatment.
 (b) Treatment 1 is the control treatment.
 (c) There are no control treatments in this experiment.
 (d) Treatments 1 and 2 are control treatments.
218. Why are mice killed by smooth (S) strains of *Streptococcus*, but not rough (R) strains?
- (a) Rough strains are virulent, and smooth strains are not.
 (b) Rough strains have a polysaccharide capsule that makes the mouse immune system recognize and destroy them.
 (c) Smooth strains have a polysaccharide capsule, which hides them from the mouse immune system.
 (d) Smooth strains grow faster than rough strains.

219. Select the correct statements -

- I. In eukaryotes, RNA pol III catalyses the synthesis of 5S rRNA, tRNA and SnRNA -
- II. DNA generally acts as a template for the synthesis of DNA and RNA
- III. During protein synthesis, amino acid gets attached to tRNA with the help of aminoacyl synthetase, ATP is also used.
- IV. The first amino acid in any polypeptide chain of prokaryote is always formylated methionine but in eukaryotes it is methionine.
- V. A single anticodon can recognize more than one codon of m-RNA. Thus phenomenon is termed as Wobble hypothesis

(a) I and II are correct (b) II and III are correct (c) All are correct (d) IV and V are correct

220. Which one is false?

- (a) Glucose and galactose can act as inducers for lac operon.
- (b) The presence of introns in split gene is reminiscent of antiquity and the process of splicing represents the dominance of DNA-world
- (c) In eukaryotes - DNA $\xrightarrow{\quad}$ hnRNA $\xrightarrow{\quad}$ mRNA
- (d) Regulation of lac operon by repressor is referred to as negative regulation. Lac / Lactose operon is under control of positive regulation as well.

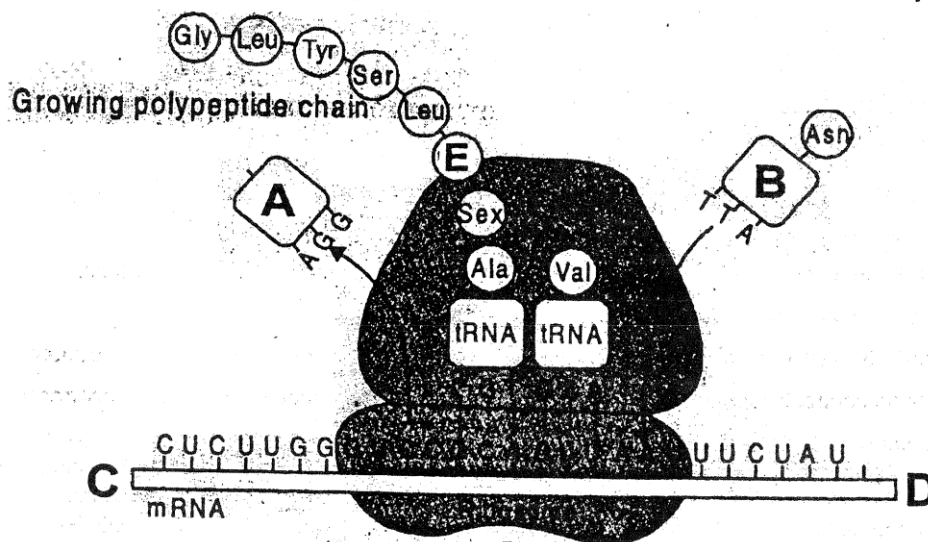
221. The regulator gene of a bacterial operon

- (a) codes for inducer substances. (b) codes for repressor proteins.
- (c) acts as an on-off switch for the structural genes. (d) is a binding site for RNA polymerase.

222. According to the Jacob-Mond (*lac* operon) model of gene regulation, inducer substances in bacterial cells probably

- (a) combine with operator regions, activating the associated operons.
- (b) combine with structural genes, stimulating them to synthesize messenger RNA.
- (c) combine with repressor proteins, inactivating them.
- (d) combine with promoter regions, activating RNA polymerase.

223. The given diagram refers to translation. In which of the four options A, B, C, D and E are correctly identify.



	A	B	C	D	E
(a)	Charged / Aminoacylated tRNA	Uncharged tRNA	5'end	3' end	Glycine
(b)	Uncharged tRNA	Charged / Aminoacylated tRNA	5'end	3' end	Glycine
(c)	Uncharged tRNA	Charged / Aminoacylated tRNA	3'end	5' end	Glycine
(d)	Uncharged tRNA	Charged / Aminoacylated tRNA	5'end	3' end	Lysine

224. Which of the following statements is correct?

- I. The biochemical nature of genetic material was not defined from the experiments conducted by Griffith
- II. Working on transformation Avery era/concluded DNA is genetic material but not all biologists were convinced
- III. RNA is the genetic material in TMV, Q8 bacteriophage etc.
- IV DNA is the predominant genetic material while RNA performs dynamic functions of messenger adapter
- V. Viruses having DNA genome and having shorter life span mutate and evolve faster

- (a) All (b) I and II (c) All except V (d) III and IV

225. The sugar lactose induces synthesis of the enzyme lactase. What happens when an *E. coli* (bacterial) cell runs out of lactose?

- (a) Repressor protein binds to the operator. (b) Repressor protein binds to the promoter,
(c) RNA polymerase attaches to the promoter. (d) RNA polymerase attaches to the repressor.

226. Which of the following statements concerning the regulator gene (R) associated with the lac operon is correct?

- (a) mRNA is transcribed from the R gene whether lactose is present or not.
(b) mRNA is transcribed from the R gene only when lactose is present.
(c) mRNA is transcribed from the R gene only when lactose is not present.
(d) Lactose inhibits the translation of R gene mRNA.

227. A very low level of expression of lac operon has to be present in the cell all the time, otherwise -

- (a) Glucose can't enter the cells (b) Water can't enter the cells
(c) Ions can't enter the cells (d) Lactose can't enter the cells

228. Following paragraph refers to a transcription unit. Fill up the blanks -

The A is located towards 5' end (I, B) of the structural gene (the reference is made with respect to the polarity of coding strand). Both the strands of DNA are involved in forming the C. The D is located towards 3' end (E) of the coding stream

- (a) A - promoter, B - upstream, C - promoter, D - terminator, E - downstream
(b) A - promoter, B - upstream, C - terminator, D - promoter, E - downstream
(c) A - promoter, B - downstream, C - promoter, D - terminator, E - upstream
(d) A - terminator, B - upstream, C - promoter, D - terminator, E - downstream

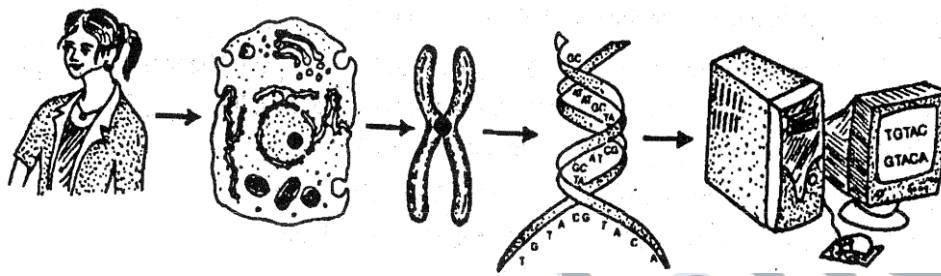
229. The length of DNA has 45000 base pairs. How many complete turns will the DNA molecule take?

- (a) 45000 (b) 450 (c) 4500 (d) 45
(d) It is present in more than 100 genes

230. An RFLP is:

- (a) DNA probe used for hybridization
(b) Variation of a DNA segment cut by restriction enzyme(s)
(c) Recessive form of a deleterious allele
(d) Restrictive enzyme used to cut DNA

231. Acodon consists of three bases and there are four kinds of bases in a nucleic acid altogether. How many codons will be there?
 (a) 60 (b) 4^3 (c) 3^4 (d) 4^6
232. DNA profiling has been used to:
 (a) Determine the identity of murder victims (b) Establish paternity
 (c) Identify victims of terrorism (d) All of these
233. The year 2003 was celebrated as the 50th anniversary of discovery of
 (a) transposon by Barbara Me Clintock (b) structure of DNA by Watson and Crick
 (c) Menders law (d) Biotechnology by Kary Mullis
234. A DNA sequence is polymorphic if:
 (a) The carrier frequency is less than 2 percent
 (b) It can be cut with a restriction enzyme
 (c) A variant sequence occurs in at least 1 percent of the population
 (d) It is present in more than 100 genes
235. Tailoring of hnRNA is done by
 (a) Snurps (b) Introns (c) Exons (d) 18SrRNA
236. Which of the following have the longest DNA sequences?
 (a) VNTRs (b) STRs (c) SNPs (d) Thymine dimers
237. Which of the following are used in DNA Profiling?
 (a) VNTRs (b) STRs (c) RFLPs (d) All of these
238. The sequence of structural gene in lac operon is
 (a) Lac A, Lac Y, Lac Z (b) Lac A, Lac Z, Lac Y
 (c) Lac, Y, Lac Z, Lac A (d) Lac Z, Lac Y, Lac A
239. The Okazaki fragments in DNA chain growth
 (a) polymerize in the 3' to 5' direction and forms replication fork.
 (b) prove semi-conservative nature of DNA replication
 (c) polymerize in the 5' to 3' direction and explain 3' to 5' DNA replication
 (d) result in transcription
240. The length of DNA molecule greatly exceeds the dimensions of the nucleus in the eukaryotic cells. How is this DNA accommodated?
 (a) Super coiling in nucleosomes (b) DNase digestion
 (c) Through elimination of repetitive DNA (d) Deletion of non-essential genes
241. The antiparallel relationship of the two strands of DNA refers to the
 (a) strands being the opposite of parallel—they are twisted.
 (b) strands providing alternative branching.
 (c) strands gning such that one strand starts with a 3' carbon, the other with a 5' carbon.
 (d) view looking at one end of the molecule: one strand has an A wherever the other has a T, and one has a G wherever the other has a C
242. The Hershey-Chase experiment determined that
 (a) protein and DNA are the hereditary material of viruses. (b) protein, not DNA, is the hereditary material of viruses,
 (c) viruses do not contain hereditary material. (d) DNA, not protein, is the hereditary material of viruses.



The above diagram shows –

- (a) Method of DNA fingerprinting (b) Human Genome Project
- (c) Humoral Analysis (d) Chromosome walking
244. The structure of DNA is characterized by a
- (a) right- or left-handed double helix and antiparallel strands.
- (b) right-handed double helix and antiparallel strands.
- (c) right-handed single helix.
- (d) right-handed single helix and parallel strands.
245. The full form of ELSI is -
- (a) Embedded Low Software Index (b) Ear Lung Spleen Immunity
- (c) Ethicallegal and Social Issue (d) Endonuclease Ligase Surface Immunity
246. Which of the following criteria must be fulfilled by a genetic material. :
- (a) Replication and Mutation (b) Stability
- (c) Express itself in the form of 'Mendelian Characters', (d) All of the above
247. DNA fingerprinting works because -
- (a) Genes containing the same alleles make it simple to compare different individuals
- (b) PCR allows amplification of proteins from single cells
- (c) There are multiple alleles for some DNA sequences, making it possible to obtain unique patterns for each individual
- (d) DNA in the skin cells is very diverse
248. Before the discovery of DNA, why was the hereditary material thought to be made of proteins and not nucleic acids?
- (a) Nucleic acids are made up of 20 different bases, while proteins are made up of only 5 amino acids.
- (b) Protein subunits can combine to form larger proteins.
- (c) Proteins seemed to be much more diverse chemically.
- (d) Proteins can be enzymes.
249. The rules formulated by Erwin Chargaff state that
- (a) A = T and G = C in any molecule of DNA (b) A = C and G = T in any molecule of DNA
- (c) A = G and C = T in any molecule of DNA (d) A = U and G = C in any molecule of RNA
250. Nonhistone chromosomal protein which forms core or axis of chromosome is
- (a) HMG protein (b) Scaffold protein (c) Regulatory protein (d) All of these
251. Bacteriophage nucleic acids were labeled by carrying out an infection of *E. coli* cells growing in
- (a) ^{14}C -labeled CO_2 . (b) ^3H -labeled water. (c) ^{32}P -labeled phosphate, (d) ^{35}S -labeled sulfate.

252. In order to show that DNA is the "transforming principle," Avery, MacLeod, and McCarty showed that DNA could transform avirulent strains of pneumococcus. This hypothesis was strengthened by their demonstration that.
- (a) enzymes that destroyed proteins also destroyed transforming activity.
 - (b) enzymes that destroyed nucleic acids also destroyed transforming activity.
 - (c) enzymes that destroyed complex carbohydrates also destroyed transforming activity.
 - (d) the transformation activity was destroyed by boiling.
253. In eukaryotes, Okazaki fragments are about _____. long.
- (a) 50 base pairs
 - (b) 150 base pairs
 - (c) 1-500 base pairs
 - (d) 150,000 base pairs
254. During replication, the new DNA strand is synthesized
- (a) in the 3' to 5' direction.
 - (b) in the 5' to 3' direction.
 - (c) in both the 3' to 5' and 5' to 3' directions from the replication fork.
 - (d) from one end to the other, in the 3' to 5' or the 5' to 3' directions.
255. The molecules that function to replicate DNA in the cell are
- (a) DNA nucleoside triphosphates.
 - (b) DNA polymerases.
 - (c) nucleoside polymerases.
 - (d) DNAses.
256. What are the three major properties of genes that are explained by the structure of DNA?
- (a) They contain information, direct the synthesis of proteins, and are contained in the cell nucleus.
 - (b) They contain nitrogenous bases, direct the synthesis of RNA, and are contained in the cell nucleus
 - (c) They encode the organisms phenotype, are passed on from one generation to the next, and contain nitrogenous bases.
 - (d) They contain information, replicate exactly, and change to produce a mutation.
257. The nitrogenous bases (and the two strands of the DNA double helix) are held together by ,
- (a) weak van der Waals forces,
 - (b) covalent bonds,
 - (c) hydrogen bonds.
 - (d) a and b
258. Why must RNA be incorporated into the DNA molecule initially during DNA replication?
- (a) RNA primase adds bases that act as primers.
 - (b) RNA primase is able to use DNA as a template.
 - (c) RNA primase is incorporated into the holoenzyme complex.
 - (d) DNA polymerase I and III can only add on to an existing strand..
259. The correct order of events for synthesis of the lagging strand is:
- (a) Primase adds RNA primer, DNA polymerase III creates a stretch, DNA polymerase I removes the primer, and ligase seals the gaps.
 - (b) Primase adds primer, DNA polymerase I removes the primer, DNA polymerase extends the segment, and ligase seals the gap.
 - (c) Ligase adds bases to the primase, the primase generates the polymerase 1, polymerase III adds to the stretch, helicase winds the DNA
 - (d) Helicase unwinds the DNA, primase creates a primer, DNA polymerase I elongates the stretch, DNA polymerase III removes the primer, and ligase seals the gaps in the DNA
260. The base-paired structure of DNA implies that it
- (a) can replicate to form identical molecules.
 - (b) can be used as a template to make RNA
 - (c) is the hereditary material.
 - (d) a and b

261. Which of the following molecules functions to transfer information from one generation to the next?
 (a) DNA (b)mRNA (c)tRNA (d)Prdteins
262. Mutations are
 (a) heritable changes in the sequence of DNA bases that produce an observable phenotype.
 (b) heritable changes in the sequence of DNA bases.
 (c) mistakes in the incorporation of amino acids into proteins.
 (d) heritable changes in the mRNA of an organism.
263. During infection of *E. coli* cells by bacteriophage T2,
 (a) proteins are the only phage components that actually enter the infected cell.
 (b) both proteins and nucleic acids enter the cell.
 (c) only protein from the infecting phage can also be detected in progeny phage.
 (d) only nucleic acids enter the cell.
264. A deoxyribose nucleotide is a
 (a) deoxyribose plus a nitrogenous base. (b) sugar and a phosphate.
 (c) deoxyribose plus a nitrogenous base and a phosphate, (d) ribose plus a nitrogenous base.
265. In DNA replication, each newly made strand is
 (a) identical in DNA sequence to the strand from which it was copied.
 (b) complementary in sequence to the strand from which it was copied.
 (c) oriented in the same 3'to 5'direction as the strand from which it was copied.
 (d) an incomplete copy of one of the parental strands.
266. In eukaryotic cells, each chromosome has
 (a) one origin of replication. (b) two origins of replication.
 (c) many origins of replication. (d) only one origin of replication per nucleus.
267. During DNA replication
 (a) one parental strand must be degraded to allow the other strand to be copied.
 (b) the parental strands must separate so that both can be copied.
 (c) the parental strands come back together after the passage of the replication fork.
 (d) origins of replication always give rise to single replication forks.
268. The fidelity of DNA replication is outstanding. During DNA synthesis, the error rate is on the order of one wrong nucleotide per
 (a) 10,000. (b) 100,000. (c) 10^{10} . (d) 10^{100} .
269. In the Meselson-Stahl experiment, the conservative model of DNA replication is ruled out by which of the following observations?
 (a) No completely heavy DNA is observed after the first round of replication.
 (b) No completely light DNA ever appears, even after several replications.
 (c) The product that accumulates after two rounds of replication is completely "heavy."
 (d) Completely "heavy" DNA is observed throughout the experiment.
270. Which of the following features summarizes the molecular architecture of DNA?
 (a) The two strands run in opposite directions.
 (b) The molecule twists in the same direction as the threads of most screws.
 (c) The molecule is a double-stranded helix and DNA has a uniform diameter.
 (d) All of the above

271. The steps of the ladder are
(a) individual nitrogenous bases. (b) pairs of bases.
(c) alternating bases and phosphate groups. (d) alternating sugars and bases.
272. Which feature of the Watson-Crick model of DNA structure explains its ability to function in replication and gene expression?
(a) Each strand contains all the information present in the double helix.
(b) Structural and functional similarities of DNA and RNA
(c) The double helix is right-handed and not left-handed.
(d) DNA replication does not require enzyme catalysts.
273. Information used by Watson and Crick to determine the structure of DNA included
(a) electron micrographs of individual DNA molecules. (b) light micrographs of bacteriophage particles,
(c) nuclear magnetic resonance analysis of DNA (d) X-ray crystallography of double-stranded DNA
274. Double-stranded DNA looks a little like a ladder that has been twisted into a helix, or spiral. The side supports of the ladder are
(a) individual nitrogenous bases. (b) alternating bases and sugars,
(c) alternating bases and phosphate groups. (d) alternating sugars and phosphates.
275. The enzyme DNA ligase is required continuously during DNA replication because
(a) fragments of the leading strand must be joined together.
(b) fragments of the lagging strand must be joined together.
(c) the parental strands must be joined back together.
(d) S'-deoxynucleoside triphosphates must be converted to 5'-deoxynucleoside triphosphates.
276. The energy necessary for making a DNA molecule*comes directly from the
(a) sugar. (b)ATP. (c) release of phosphates. (d)NADPH.
277. When adding the next monomer to a growing DNA strand, the monomer is added to the
(a) 1' carbon of the deoxyribose. (b) 2' carbon of the deoxyribose.
(c) 3' carbon of the deoxyribose. (d) 4' carbon of the deoxyribose.
278. The first scientist(s) to suggest a mode of replication for DNA was (were)
(a) Linus and Pauling. (b) Hershey and Chase. (c) Albert Leverman. (d) Watson and Crick.
279. Chargaff's rule states that
(a) DNA must be replicated before a cell can divide.
(b) viruses enter cells without their protein coat.
(c) only protein from the infecting phage can also be detected in progeny phage.
(d) the amount of cytosine equals the amount of guanine.
280. Griffith's experiments showing the transformation of R strain pneumococcus bacteria to S strain pneumococcus bacteria in the presence of heat-killed S strain bacteria gave evidence that
(a) an external factor was affecting the R strain bacteria
(b) DMA was definitely the transforming factor.
(c) S strain bacteria could be reactivated after heat killing.
(d) All of the above

281. The Hershey-Chase experiment
- (a) proved semiconservative replication is the mode for DNA replication.
 - (b) used ^{32}P to label protein.
 - (c) used ^{35}S to label DNA
 - (d) helped to prove DNA was the genetic molecule.
282. Which one of the following is not found in DNA?
- (a) Carbon
 - (b) Oxygen
 - (c) Nitrogen or Hydrogen
 - (d) Sulfur
283. The difference between DNA and RNA is that
- (a) DNA has thymine and RNA has uracil.
 - (b) DNA has no oxygen bonded to the 2' carbon; RNA does.
 - (c) DNA is the genetic material; RNA is not
 - (d) DNA is double stranded and RNA can't have hydrogen bond.
284. The building blocks for a new DNA molecule are
- (a) deoxyribose nucleoside monophosphates.
 - (b) deoxyribose nucleoside diphosphates.
 - (c) deoxyribose nucleoside triphosphates.
 - (d) deoxyribose nucleotide diphosphates
285. Synthesis of DNA is
- (a) spontaneous.
 - (b) endergonic.
 - (c) exergonic.
 - (d) pseudogenic
286. A deoxyribose nucleoside is a
- (a) deoxyribose plus a nitrogenous base.
 - (b) sugar and a phosphate.
 - (c) deoxyribose plus a nitrogenous base and a phosphate.
 - (d) ribose plus a nitrogenous base.
287. What was most remarkable about the Griffith experiment?
- (a) Griffith obtained his results despite the fact that he failed his medical board exam.
 - (b) DNA, not protein, was found to be the genetic molecule.
 - (c) Something from a dead organism could change living cells.
 - (d) Viruses, which were nonliving, could change living cells.
288. When bands of RNA are transferred to a nitrocellulose membrane for identification, the blotting is called
- (a) Southern Blotting
 - (b) Northern Blotting
 - (c) Western Blotting
 - (d) Eastern Blotting
289. Ideally, PCR _____ increases the amount of DNA during additional cycles.
- (a) additively
 - (b) gradually
 - (c) linearly or systematically
 - (d) exponentially
290. Complete genome of which non-crop and crop plants has been sequenced?
- (a) *Datura* and wheat respectively
 - (b) *Arabidopsis* and maize respectively
 - (c) *Oenothera* and oat respectively
 - (d) *Arabidopsis* and rice respectively
291. The first repair of mistakes made during DNA replication is made by
- (a) the mismatch repair system.
 - (b) DNA polymerase.
 - (c) excision repair.
 - (d) SOS repair.
292. The force that holds DNA together in a double helix is
- (a) the force of the twist.
 - (b) covalent bonds,
 - (c) ionic bonds or ionic interactions
 - (d) hydrogen bonds.

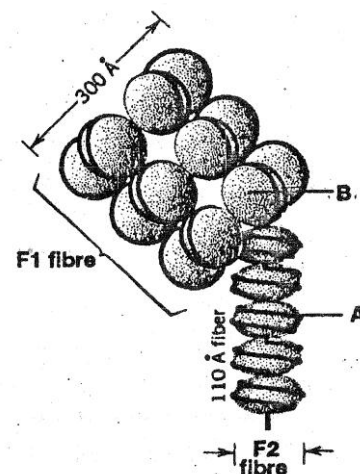
293. Boiling DNA causes it to become
 (a) single stranded. (b) monomers.
 (c) destroyed. (d) smaller the longer it is boiled.
294. Number of base pairs in DNA helix around the octamer histone molecule is
 (a) 140 - 200 bp (b) 100 -150 bp (c) 40 - 67 bp (d) 200 - 260 bp
295. Pyrophosphate is a
 (a) building block for DNA synthesis. (b) by-product of DNA synthesis.
 (c) precursor to DNA synthesis. (d) free phosphate used in nucleic acid metabolism.
296. Griffith could distinguish the two strains of pneumococcus due to
 (a) colony appearance in culture. (b) differences in their lethality in mice,
 (c) their sizes. (d) a and b
297. International Human Genome Project began in
 (a) 1990 (b) 1996 (c) 2000 (d) 2001
298. In PCR, it is _____ that creates single-stranded template molecules.
 (a) heat (b) high salt concentration (c) DNA polymerase (d) exonuclease
300. The error rate of changing an incorrect base with another incorrect base during proofreading is
 (a) 1 in 10 bases. (b) 1 in 100 bases. (c) 1 in 1,000 bases. (d) 1 in 10,000 bases.
301. The enzyme that unwinds the DNA prior to replication is called
 (a) DNA polymerase III. (b) DNA ligase. (c) primase. (d) helicase.
302. The enzyme that restores the phosphodiester linkage between adjacent fragments in the lagging strand during DNA replication is
 (a) DNA ligase. (b) primase. (c) reverse transcriptase. (d) helicase.
303. To show that DNA in cell extracts was responsible for genetic transformation in pneumococcus, important corroborating evidence was that
 (a) enzymes that destroyed proteins also destroyed transforming activity.
 (b) enzymes that destroyed DNA also destroyed transforming activity.
 (c) enzymes that destroyed polysaccharides also destroyed transforming activity.
 (d) boiling destroyed transforming activity.
304. Which of the following statements about DNA replication is false?
 (a) Okazaki fragments are the initiators of continuous DNA synthesis along the leading strand.
 (b) Replication forks represent areas of active DNA synthesis on the chromosomes.
 (c) Error rates for DNA replication are often less than one in every billion base pairings.
 (d) Ligases and polymerases function in the vicinity of replication forks.
305. The primary function of DNA polymerase is to
 (a) add nucleotides to the growing daughter strand.
 (b) seal nicks along the sugar-phosphate backbone of the daughter strand.
 (c) unwind the parent DNA double helix.
 (d) prevent reassociation of the denatured parent DNA strands.
306. What are the mini-satellites?
 (a) r-DNA (b) VNTR (c) c-DNA (d) SAT

307. Evidence indicating that DNA replication was semiconservative came from
 (a) DNA staining techniques. (b) DNA sequencing.
 (c) density gradient studies using "heavy" nucleotides. (d) None of the above
308. A fundamental requirement for the function of genetic material is that it must be
 (a) conserved among all organisms with very little variation.
 (b) passed intact from organism to organism.
 (c) replicable.
 (d) found outside of the nucleus.
309. Watson and Crick's model allowed them to visualize
 (a) the molecular bonds of DNA
 (b) how the purines and pyrimidines fit together in a double helix.
 (c) that the two strands of the DNA double helix were antiparallel.
 (d) All of the above
310. Chargaff's rules of base pairing states that
 (a) the ratio of purines to pyrimidines is roughly equal in all tested organisms.
 (b) the ratio of A to T is roughly equal in all tested organisms.
 (c) the ratio of A + T and G + C is roughly equal in all tested organisms.
 (d) a and b
311. If a nucleotide lacking a hydroxyl group at the 3' end is added to a PCR, what would be the outcome?
 (a) No additional nucleotides would be added to a growing strand containing that nucleotide.
 (b) Strand elongation would proceed as normal.
 (c) Nucleotides would only be added at the 5' end.
 (d) *T. aquaticus* DNA polymerase would be denatured.
312. Which of the following represents a bond between a purine and a pyrimidine (in that order)?
 (a) C-T (b) G-A (c) G-C (d) T-A
313. DNA replication is an _____ process and _____ energy.
 (a) exergonic; does not require (b) endothermic; does require
 (c) endergonic; does require (d) endodonic; does not require
314. RNA primers are necessary in DNA synthesis because
 (a) DNA polymerase can only add to an existing strand of nucleotides.
 (b) DNA polymerase can only add to an existing RNA strand.
 (c) DNA primase is the first enzyme in the replication complex.
 (d) All of the above
315. Hershey and Chase used radioactive ^{35}S and ^{32}P in experiments to provide evidence that DNA was the genetic material. These experiments pointed to DNA because
 (a) progeny viruses retained ^{32}P but not, ^{35}S .
 (b) retention of ^{32}P in progeny viruses indicated that DNA was passed on.
 (c) loss of ^{35}S in progeny viruses indicated that proteins were not passed on,
 (d) All of the above
316. X-ray crystallography provides information about the _____ of DNA but is limited because of the _____ of DNA. The technique is based on the pattern of _____ of the atoms in the molecule.
 (a) structure; difficulty of purification; light absorption (b) dimensions; molecular weight; diffraction
 (c) molecular weight; shape; diffraction (d) dimensions; linearity; light absorption

317. Experiments by Avery, MacLeod, and McCarty supported DNA as the genetic material by showing that
- (a) both protein and DNA samples provided the transforming factor.
 - (b) DNA was not complex enough to be the genetic material.
 - (c) only samples with DNA provided transforming activity.
 - (d) even though DNA was molecularly simple, it provided adequate variation to act as the genetic material.
318. Proofreading and repair occur
- (a) at anytime during or after synthesis of DNA
 - (b) only before DNA methylation occurs.
 - (c) only in the presence of DNA polymerase.
 - (d) only in the presence of an excision repair mechanism.
319. *T. aquaticus* DNA polymerase is not denatured during the heat cycling required to denature DNA. This property allowed advances in what technique?
- (a) RFLP analysis
 - (b) PCR
 - (c) Sequencing
 - (d) EPA
320. nu body of nucleosome consists of
- (a) H₁ and H₂A
 - (b) H₂A and H₂B
 - (c) H₃ and H₄
 - (d) Both (b) & (c)
321. Which of the following model organisms has been sequenced?
- (a) *Drosophila*
 - (b) Bacteria
 - (c) Yeast
 - (d) All
322. The unequivocal proof that DNA is the genetic material came from the experiment which utilised -
- (a) Streptococcus
 - (b) T₂, E. coli
 - (c) E. coli, heavy nitrogen
 - (d) P³², S³⁵, R-type bacteria
323. Which of the following statements about the work of Griffith, and then Avery, MacLeod, and Me Carty, on *Streptococcus pneumoniae* is false?
- (a) Only the S strain has a cell wall-like capsule.
 - (b) The mouse in Griffith's experiments would also have died if injected with living S strain and heat-killed R strain.
 - (c) The transforming principle is associated with the S strain's capsule.
 - (d) Transformation of living R strain into S strain could also occur in a test tube without involving a mouse.
324. The polymerase chain reaction
- (a) is a method for sequencing DNA
 - (b) is used to transcribe specific genes,
 - (c) amplifies specific DNA sequences.
 - (d) does not require DNA replication primers.
325. The leading strand and lagging strand in DNA replication differ in that only on the lagging strand
- (a) DNA is replicated as short fragments.
 - (b) RNA primer is present,
 - (c) replication proceeds in the 5' to 3' direction.
 - (d) DNA ligase is not needed.
326. Which of the following is not required for DNA replication?
- (a) A short strand of RNA to act as a primer.
 - (b) DNA to act as a template,
 - (c) Deoxyribonucleoside triphosphates.
 - (d) ATP for energy.
327. The 3' end of a DNA strand is defined as the place where
- (a) the phosphate group is not bound to another nucleotide.
 - (b) both DNA strands end opposite each other.
 - (c) DNA polymerase binds to begin replication.
 - (d) there is a free —OH group at the 3' carbon of deoxyribose.
328. Western Blot hybridization is used for
- (a) DNA analysis
 - (b) RNA analysis
 - (c) Protein analysis
 - (d) Polysaccharide analysis

329. In semiconservative replication of DNA,
 (a) the original double helix remains intact and a new double helix forms.
 (b) the strands of the double helix separate and act as templates for new strands.
 (c) polymerization is catalyzed by RNA polymerase.
 (d) polymerization is catalyzed by a double helical enzyme.
330. Which statement about complementary base pairing is not true?
 (a) It plays a role in DNA replication.
 (b) In DNA, T pairs with A *
 (c) Purines pair with purines, and pyrimidines pair with pyrimidines.
 (d).In DNA, C pairs with G.
331. The adjoining figure represents the structure of basic 30 nm fibre of chromosome of eukaryotes. Identify F1, F2, A and B shown in the figure.

	F1	F2	A	B
(a)	Solenoid	Nucleosome	DNA	Histone octamer
(b)	Solenoid	Nucleosome	RNA	Histone octamer
(c)	Solenoid	Nucleosome	DNA	Nonhistone octamer
(d)	Nucleosome	Solenoid	DNA	Histone octamer



332. The length of E. coli DNA and length of DNA in a human 2N cell is -
 (a) 1.36 mm and 2.2m respectively (b) 1.36 mm and 2.2 mm respectively
 (c) 1.36 fim and 2,2 jam respectively (d) 1.36 cm and 2.2 cm respectively
333. The entire genetic code consists of ___ amino acids and ___ codons.
 (a) 20,20 (b) 20,64 (c) 30,60 (d) 30,72
334. What do telomeres do?
 (a) They protect the chromosomes from degradation by nucleases.
 (b) They prevent the ends of chromosomes from fusing with one another.
 (c) They are required for complete chromosomal replication.
 (d) All of these are correct.
335. Choose the correct statement w.r.t satellite DNA-
 (a) Show high degree of polymorphism (b) Form basis of DNA fingerprinting
 (c) Part of both coding and non-coding sequences (d) More than one option is correct
336. Enzyme utilised for the synthesis of RNA copolymers and homopolymers during deciphering of genetic code is-
 (a) DNA dependent RNA polymerase (b) RNA dependent DNA polymerase
 (c) DNA independent RNA polymerase ' (d) DNA dependent DNA polymerase
337. Blotting technique involves transfer of DNA from
 (a) Membrane to gel (b) Gel to membrane (c) Sol to gel (d) Gel to sol
338. Separation of DNA fragments into bands by electrophoresis is done on
 (a) Agarose gel (b) Polyacrylamide gel (c) Arabic gum (d) Both (a) and (b)

339. Father of DNA fingerprinting is
(a) Alec Jeffreys (b) Lalji Singh (c) V.K. Kashyap (d) E.M. Southern
340. Sequencing the whole set of genome that contains all the coding and non coding parts is
(a) Expressed Sequence Tags (b) Sequence Annotation
(c) Microarray (d) Electrophoresis
341. The last human chromosome which sequence was completed in May 2006 is
(a) Chromosome 22 (b) Chromosome 14 (c) Chromosome 1 (d) Chromosome X and Y
342. According to Human Genome Project, the percentage of introns in human genome is approximately
(a) 10% (b) 24% (c) 75% (d) 99%
346. HOP methodology which includes identification of all the genes that expressed as RNA is referred as
(a) RFLP (b) ESTs (c) VNTR (d) RAPD's
344. SNP which is pronounced as "snips" stands for
(a) Small nuclear protein (b) Single nucleotide particle
(c) Single nucleotide polymorphism (d) Small nicking points
345. The Human Genome Project as megaproject was a 13 year project coordinated by the
(a) U.S. Department of Energy (b) National Institute of Health
(c) U.S. Department of Molecular Biology (d) Both (a) and (b)
346. In mammalian cells, the DNA of the centromere is characteristic of:
(a) facultative heterochromatin. (b) constitutive heterochromatin.
(c) Euchromatin. (d) dispersed chromatin.
347. When chromatin is treated with nonspecific nucleases, what is the length of the resulting pieces of DNA?
(a) random numbers of base pairs (b) about 60 base pairs
(c) about 8 base pairs (d) about 200 base pairs
348. Which of the following is the best order of sequential, increasing condensation (packing) of DNA
(a) nucleosomes → solenoid → 30 nm fiber → Loops on scaffold → heterochromatin
(b) euchromatin → solenoid → 30 nm fiber → nucleosomes
(c) nucleosomes → 30 nm fibers → euchromatin → heterochromatin
(d) nucleosomes → 30 nm fibers → solenoid → Loops on scaffold
349. More than one initiation codon and termination codons are found in which m-RNA
(a) Prokaryotic m-RNA (b) Eukaryotic m-RNA (c) Heteronuclear RNA (d) Ribosomal RNA
350. An mRNA ready for translation would have
(a) introns, coding exons and non-coding exons. (b) coding exons and non-coding exons.
(c) only coding exons. (d) only coding exons and introns.
351. In m-RNA base sequence is 5' AAC CAA GAC CCC 3' what is the possible no. of codons in case of overlapping and non overlapping respectively.
(a) 4,10 (b) 10,4 (c) 12,10 (d) 10,8
352. The unequivocal proof of DNA as the genetic material came from the studies on a
(a) Viroid (b) Bacterial virus (c) Bacterium (d) Fungus
353. During translation, the _____ site within the ribosome holds the growing amino acid chain while the _____ site holds the next amino acid to be added to the chain.
(a) A,P (b) P,A (c) A..B (d) B,A
354. Chromosomes must condense to approximately 1/500th of their length for cell division. The first reduction is _____.
(a) Coiling around nucleosomes (b) Looping of 300 nm fibers
(c) Looping of solenoid fibers to form a 300 nm fiber (d) Forming a coiled solenoid fiber
355. The histone protein that attaches to DNA strands between nucleosomes is _____.
(a) H1 (b) H4 (c) H2A (d) H2B
356. During chromosome replication, the following events occur
I. Breaking of H bonds between bases
II. Bonds between adjacent nucleotides form
III. Winding brings about formation of two double helices
IV. Bases on free nucleotides bond with bases on DNA strands
Which of the following shows the correct sequence? ,••,•
(a) I, III, II, IV (b) I, IV, II, III (c) I, II, IV, III (d) IV, II, III, I
357. What are those str. that appear as 'beads-on-string' in the chromosomes when viewed under electron microscope?

- (a) Base pairs (b) Genes (c) Nucleotides (d) Nucleosomes
358. Which one of the following also acts as a catalyst in a bacterial cell?
 (a) 23 sr RNA (b) 5srRNA (c) snRNA (d) hnRNA
359. Venkataraman Ramakrishnan is one of the three recipients of the 2009 Nobel Prize for Chemistry. He worked towards the elucidation of the three-dimensional structure of ribosomes. Ribosomes are involved in the biosynthesis of proteins and
 (a) one of their protein components is the catalyst.
 (b) one of their RNA components is the catalyst.
 (c) they bind to DNA for the purpose of protein synthesis.
 (d) they bind either to tRNA or to mRNA at any given time.
360. Transcription and translation of a gene composed of 30 nucleotides would form a protein containing no more than _____ amino acids.
 (a) 10 (b) 15 (c) 60 (d) 90
361. Which mode of information transfer usually does not occur?
 (a) DNA to DNA (b) DNA to RNA
 (c) DNA to protein (d) all occur in a working cell
362. Which of the following statements is true regarding introns?
 (a) Introns are the parts of mRNA that are translated.
 (b) Introns have no function.
 (c) In general, human genes have fewer introns than genes of other organisms.
 (d) Introns may be involved in exon shuffling.
363. Of the _____ different possible codons, _____ specify amino acids and _____ signal stop,
 (a) 20, 17, 3 (b) 180, 20, 60 (c) 64, 61, 3 (d) 61, 60, 1
364. If genetic code is tetraplet then what is the possible number of codons which code 20 types of amino acids -
 (a) 261 (b) 64 (c) 256 (d) 43
365. Which enzyme/s will be produced in a cell in which there is a nonsense mutation in the lac Y gene?
 (a) Lactose permease (b) Transacetylase
 (c) Lactose permease and transacetylase (d) B-galactosidase
366. Removal of RN
 A polymerase III from nucleoplasm will affect the synthesis of:
 (a) t RNA (b) hn RNA (c) m RNA (d) r RNA
367. Removal of introns and joining of exons in a defined order during transcription is called :
 (a) Looping (b) Inducing (c) Slicing (d) Splicing
368. If one strand of DNA has the nitrogenous base sequence atATCTG, what would be the complementary RNA strand sequence
 (a) TTAGU (b) UAGAC (c) AACTG (d) ATCGU
369. Ribosomal RNA is actively synthesized in
 (a) Lysosomes (b) Nucleolus (c) Nucleoplasm (d) Ribosomes
370. Which one of the following is not a part of a transcription unit in DNA?
 (a) The inducer (b) A terminator (c) A promoter (d) The structure gene
371. Out of 64 codons, the number of codons with GGG is
 (a) 1 (b) 2 (c) 4 (d) 6
372. Some amino acids are coded by more than one codon hence the code is
 (a) unambiguous (b) degenerate (c) universal (d) initiator.
373. The number of codons that code different amino acids is -
 (a) 16 (b) 31 (c) 61 (d) 64
374. Crick, one of the discoverers of DNA double helical structure, was the man of
 (a) Physics (b) Chemistry (c) Zoology (d) Botany.
375. What is it that forms the basis of DNA Fingerprinting?
 (a) The relative proportions of purines and pyrimidines in DNA

- (b) The relative difference in the DNA occurrence in blood, skin and saliva
(c) The relative amount of DNA in the ridges and grooves of the fingerprints.
(d) Satellite DNA occurring as highly repeated short DNA segments
376. Which one of the following is a wrong statement regarding mutations ?
(a) Deletion and insertion of base pairs cause frame-shift mutations
(b) Cancer cells commonly show chromosomal aberrations
(c) UV and Gamma rays are mutagens
(d) Change, in a single base pair of DNA does not cause mutation
377. The diagram shows an important concept in the genetic implication of DNA. Fill in the blanks A to C
(a) A-translation, B-transcription, C-Erwin Chargaff (b) A-transcription, B-translation, C-Francis Crick
(c) A-translation, B-extension, C-Rosalind Franklin (d) A-transcription, B-replication, C-James Watson

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	c	c	b	a	d	d	d	d	b	a	c	b	a	d	b	c	b	a	a	b
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	d	a	c	d	d	d	a	c	a	b	b	b	d	b	b	b	b	b	a	c
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	b	b	a	c	d	d	b	b	c	d	c	a	d	d	d	b	b	c	d	c
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	a	b	b	b	c	a	c	c	a	d	d	c	a	c	c	c	d	c	b	d
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	d	a	b	a	d	b	b	d	b	b	b	c	b	c	c	c	a	c	c	a
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	d	c	b	d	c	d	c	d	d	c	a	c	a	a	a	a	a	d	b	c
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	b	c	a	c	a	d	c	b	d	a	c	a	a	d	a	d	b	c	c	b
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	b	c	b	c	c	d	b	b	a	a	a	d	a	b	c	c	d	b	b	c
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	b	c	d	b	c	d	a	b	b	b	d	b	b	a	c	b	c	c	a	a
Ques.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
Ans.	d	a	b	d	a	b	d	a	a	a	c	d	a	a	d	b	c	d	a	d
Ques.	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
Ans.	b	a	d	a	c	a	b	a	d	a	d	d	d	d	c	c	d	c	c	a
Ques.	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
Ans.	b	c	b	c	a	a	d	a	c	b	b	d	b	c	a	a	d	d	c	a
Ques.	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
Ans.	c	d	b	b	c	d	c	c	a	b	c	b	b	b	b	d	c	a	d	d
Ques.	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280
Ans.	a	b	d	c	b	c	b	c	a	d	b	a	d	d	b	c	c	d	d	a
Ques.	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
Ans.	d	d	a	c	b	a	c	b	d	d	a	d	a	a	b	d	a	a	d	d
Ques.	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
Ans.	a	d	b	a	a	b	c	c	d	d	a	c	c	a	d	b	c	a	b	d
Ques.	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340
Ans.	d	b	c	c	a	d	d	c	b	c	a	a	b	d	d	c	b	d	a	c
Ques.	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360
Ans.	c	b	b	c	d	b	a	a	a	c	b	b	b	a	a	b	d	a	b	a
Ques.	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377			
Ans.	c	d	c	b	d	a	d	b	a	a	a	b	c	a	d	d	b			

1. During the time of "Origin of Life" the water of primitive ocean has been called "Lot dilute soup" of organic substances by-
 (a) Miller (b) Oparin (c) Heldane (d) Sidney fox
2. 'Modern theory of origin of life' was propounded by:
 (a) Oparin (b) Miller (c) Darwin (d) Khorana
3. Which one is present today but was absent about 3 to 5 million years ago?
 (a) N_2 (b) O_2 (c) H_2 (d) CH_2
4. There is no life in Moon due to the absence of:
 (a) water (b) light (c) temperature (d) oxygen
3. Select the correct statement -
 I. Swan-necked flask experiment was done by Louis Pasteur.
 II. The early belief of the spontaneous origin of life was disproved by Louis Pasteur.
 III. Louis Pasteur is famous for germ theory of disease develop from pre-existing.
 IV. The idea that life originates from pre-existing life is referred as biogenesis theory.
 V. Father sudrez was one of the greatest advocates of theory of special creation.
 VI . Cosmozoic theory of the origin of life was proposed by Richter.
 VII. The founder of 'theory of catastrophism' is Georges Cuvier.
 (a) All are correct (b) I, II, IV, VI only (c) III, V, VII (d) None
8. Chemical theory of origin of life was given by:
 (a) Spallanzani (b) Louis Pasteur (c) Stanley Miller (d) Oparin and Haldan
9. Which compound had a very important role in prebiotic evolution?
 (a) CH_4 (b) NO (c) SO_2 (d) SO_3
10. Who performed an experiment to prove that organic compounds were the basis of life?
 (a) Calvin (b) Miller (c) Oparin (d) Melvin
11. On the primitive Earth, polymers such as proteins and nucleic acids in aqueous suspension formed the spherical aggregates. These are called:
 (a) liposomes (b) primitogens (c) coacervates , " (d) primitosomes
12. Coacervates belongs to the category of.
 (a) protozoans (b) cyanobacteria
 (c) molecular aggregates (d) molecular aggregates surrounded by lipid membrane
13. Coacervates were experimentally produced by:
 (a) Urey and Miller (b) Jacob and Monod • (c) Fischer and Huxley (d) Sidney Fox and Oparin
14. Stanley Miller conducted experiments in 1953 on prebiotic Earth environment using special apparatus. The primary surprising products were:
 (a) peptides (b) nucleotides (c) amino acids (d) simple sugars

15. Life cannot originate from inorganic material at present because of:
 (a) absence of raw material (b) very low atmospheric temperature
 (c) high degree of environmental pollution (d) very high amount of oxygen in atmosphere
16. The basic components of atmosphere of primitive Earth were:
 (a) ammonia, methane and water (b) methane, ozone, nitrogen and water
 (c) hydrogen, nitrogen, methane and water (d) ammonia, methane, hydrogen and water
17. About how long ago was the Earth
 (a) 3.0 billion years ago (b) 10 billion years ago (c) 4.6 billion years ago (d) 20 billion years ago
18. Abiogenesis means:
 (a) spontaneous generation (b) origin of viruses and microbes
 (c) origin of life from living organisms (d) origin of life from nonliving organism
19. Which of the following experiments suggests that simplest living organisms could not have originated spontaneously from nonliving matter?
 (a) Microbes did not appear in stored meat
 (b) Larvae could appear in decaying organic matter
 (c) Microbes appeared from unsterilized organic matter
20. The theory which explains the origin of life and is based upon experiments is:
 (a) biogenesis (b) catastrophism (c) abiogenesis (d) chemical theory
21. Oparin's theory of 'Origin of life' is based on:
 (a) chemical evolution (b) cosmic evolution (c) artificial synthesis (d) organic evolution
22. Which was first photosynthetic organism?
 (a) Red algae (b) Green algae (c) Cyanobacteria (d) Protobionts
23. Which one of the following is incorrect about the characteristic of protobionts (coacervates and microspheres) as envisaged in abiogenic origin of life?
 (a) They were able to reproduce (b) They could maintain an internal environment
 (c) They were partially isolated from the surroundings
 (d) They could separate combinations of molecules from the surroundings
24. Bacteria that live around deep-sea hot water vents obtain energy by oxidising inorganic hydrogen sulphide belched out by the vents. They use this energy to build organic molecules from carbon obtained from the carbon dioxide in the sea water. These bacteria might be described as-
 (a) Photoheterotrophs (b) Chemoautotrophs (c) Photoautotrophs (d) Chemoheterotrophs
25. Organisms which obtain energy by the oxidation of reduced inorganic compounds are called:
 (a) saprozoic (b) chemoautotrophs (c) photoautotrophs (d) coproheterotrophs
26. The presence of salts (NaCl and others) in the animal body fluids gives an inference that life originated in the:
 (a) rain water (b) salt solutions (c) primitive ocean (d) none of these
27. Stanley Miller proposed origin of life by:
 (a) biogenesis (b) abiogenesis (c) chemical synthesis (d) none of these
28. Life originated in the era:
 (a) proterozoic (b) Mesozoic (c) precambrian (d) coenozoic

29. Select the wrong pair:
 (a) Oparin — Protobiont (b) Spallanzani — Abiogenesis
 (c) Fox — Coacervates (d) Haldane — Hot dilute soup
30. The most primitive cell-like chemical aggregates capable of growth and division were -
 (a) eobionts (b) prokaryotes (c) microspheres (d) chemoautotrophs
31. The basis of life is:
 (a) lipid (b) protein (c) nucleic acid (d) nucleoprotein
32. Which of the following experiments suggests that simplest living organisms could not have originated spontaneously from non-living matter-
 (a) Microbes did not appear in stored meat
 (b) Larvae could appear in decaying organic matter
 (c) Microbes appeared from unsterilised organic matter
 (d) Meat was not spoiled, when heated and kept sealed in a vessel
33. Origin of life as a result of chemical evolution was properly explained by:
 (a) Fox (b) Oparin (c) Watson (d) Haeckel
34. Which of the following evolved first?
 (a) Coacervates (b) Viroids (c) Cyanobacteria (d) Mycoplasma
35. The oldest eukaryotic fossil is:
 (a) 1.5 billion years old (b) 3.5 billion years old (c) 2.5 billion years old (d) 600 million years old
36. Which one of the following amino acids was not found to be synthesized in Miller's experiment?
 (a) Alanine (b) Glycine (c) Aspartic acid (d) Glutamic acid
37. The primitive Earth conditions were experimentally shown by.
 (a) Miller (b) Urey (c) Oparin (d) Both (a) and (b)
38. Egg laying mammals and marsupials are found in Australia and nowhere else. This indicates:
 (a) natural barrier (b) climatic barrier
 (c) continuous distribution (d) discontinuous distribution
39. Which of the following are homologous organs?
 (a) Wings of insects and bats
 (b) Fins of fishes and flippers of whale
 (c) Fins of fishes and forearms of human
 (d) Forearm of human, bat's wings and whale's flippers, forelimbs of horse
40. Peripatus is a connecting link between-
 (a) annelids and helminths (b) annelids and molluscs
 (c) annelids and arthropods (d) reptiles and mammals
41. Which one of the following pairs has homologous organs?
 (a) Air bladder of fish and lungs of frog (b) Wings of a bat and wings of cockroach
 (c) Wings of a bird and wings of a butterfly (d) Pectoral fins of a fish and forelimbs of a horse
42. The organs which look different but have the same basic structure and origin are known as:
 (a) homologous (b) vestigial (c) heterologous (d) analogous

43. Two zoogeographical regions separated by high mountain ranges are:
 (a) Oriental and Austr an (b) Palaearctic and Oriental
 (c) Nearctic and Palaearctic (d) Neotropical and Ethiopian
44. Evolutionary convergence is the development of:
 (a) common set of characters in groups of different ancestry
 (b) common set of characters in closely related groups
 (c) dissimilar characters in closely related groups
 (d) random mating
45. Peripatus is a connecting link between:
 (a) annelids and molluscs (b) reptiles and mammals
 (c) annelids and arthropods (d) annelids and helminthes
46. Analogous structures are:
 (a) similar in origin and function (b) different in origin and function
 (c) different in origin but similar in function (d) similar in origin but different in function
47. Which is incorrect?
 (a) Wings of insects and bats are analogous (b) Wings of bats and birds are homologous
 (c) Wings of insects and birds are analogous (d) Wings of insects and birds are homologous
48. Eyes of an Octopus and mammals appear quite similar, but these are different in their basic structure and origin, heave they are:
 (a) ancestral organs (b) analogous organs
 (c) homologous organs (d) both homologous and analogous organs
49. Atavism in man means:
 (a) appearance of new characters (b) evolution of existing characters
 (c) appearance of ancestral characters (d) loss of some pre-existing characters
50. Which pair of organs are analogous in nature?
 (a) Gill of fish and gill of prawn (b) Ear of frog and ear of rabbit
 (c) Arm of man and limb of horse (d) Wing of bat and flipper of seal
51. The classical example of adaptive radiation in development of new species is:
 (a) Darwin's finches (b) Marsupials of Austr a (c) Both of these (d) None of these
52. Evolutionary history of a group of organisms is called:
 (a) ontogeny (b) taxonomy (c) systematics (d) phylogeny
53. Presence of gills in the tadpole of frog indicates that:
 (a) frogs evolved from gilled ancestors (b) fishes were amphibious in the past
 (c) fishes evolved from frog-like ancestors (d) frogs will have gills in future
54. The greatest evolutionary change enabling the land vertebrates to be completely free from water was the development of-
 (a) lungs (b) four legs
 (c) four chambered heart (d) cleidoic eggs and internal fertilization
55. Jurassic period of the Mesozoic era in characterized by-
 (a) Gymnosperms were dominant plants and first binds appeared
 (b) Radiation of reptiles and origin of mammals like reptiles

- (c) Dinosaurs became extinct and angiosperms appeared
(d) Flowering plants and first dinosaurs appeared

56. Dinosaurs became extinct during:
(a) Jurassic (b) Triassic (c) Permian (d) Cretaceous
57. Birbal Sahni was a:
(a) zoologist (b) ornithologist
(c) palaeobotanist (d) founder of Central Drug Research Institute (CDRI)
58. Which of the following is not an atavistic character?
(a) Dense body hairs (b) Enlarged canines
(c) Presence of six fingers (d) Presence of tail in some babies
59. Which is a set of evidences of evolution?
(a) Homologous and analogous organs (b) Homologous and vestigial organs
(c) Analogous and vestigial organs (d) None of the above
60. Flippers of seal are modified:
(a) fins (b) gills (c) forelimbs (d) hindlimbs
61. Which of the following are not analogous organs?
(a) Stings of honeybee and scorpion (b) Fins of fishes and flippers of whales
(c) Wings of insect and wings of pterosaur (d) Thorn of Bougainvillea and tendril of Cucurbita . . ,
62. Which group includes homologous organs?
(a) Wings of butterfly, flying fish and bird (b) Tentacles of Hydra and arms of starfish
(c) Fins of seal, wings of birds and forelimbs of man (d) Horns of cattle, tail of horse and teeth of mammals
63. Convergent evolution is shown by:
(a) rabbit and dog (b) starfish and jellyfish (c) fish and whale (d) bacteria and Amoeba
64. Which of the following are analogous organs?
(a) Wings of bird and bat (b) Wings of insect and bird
(c) Forelegs of horse and arms of man (d) Flippers of whale and forelimbs of man
65. Tasmanian wolf is a marsupial while wolf is a placental mammal. This shows:
(a) genetic drift (b) parallel evolution
(c) divergent evolution (d) inheritance of acquired characters
66. Which are of the following characters provides a strong evidence in support of organic evolution-
(a) Gill clefts in vertebrate embryo (b) Wings in insects, birds and bats
(c) Jointed legs in arthropods and in mammals (d) Excretory organ of earthworms and frog
67. Which era could be called the "age of mammals and birds"?
(a) Palaeozoic (b) Mesozoic (c) Cretaceous (d) Cenozoic
68. In which case is Darwin's theory wrong?
(a) Arrival of fittest (b) Survival of fittest (c) Origin of species (d) High efficiency of reproduction
69. Sum of all the genes in a population is called:
(a) genome (b) gene pool (c) germplasm (d) gene bank

70. Hugo deVries' theory of mutation:
- (a) does not rule out natural selection theory (b) opposed natural selection theory
(c) contradicted Lamarck's theory (d) opposed germplasm theory
71. A mutation is most likely to have a selective advantage in evolution if:
- (a) it affects dominant genes (b) it affects recessive genes
(c) it affects whole chromosomes (d) the environment remains stable
72. The most accepted and recent theory of organic evolution is:
- (a) Lamarckism (b) Darwinism (c) Theory of isolation (d) Synthetic theory
73. Some organisms escape detection from enemies by resembling other organisms.
- (a) mimicry (b) homology (c) natural selection (d) artificial selection
74. Connecting link between ape and man is-
- (a) Neanderthal man (b) Cro-magnon man (c) Australopithecus (d) Lemur
75. According to fossils, which have been discovered up to the present time, origin and evolution of man took place in-
- (a) Java (b) Africa (c) France (d) China
76. The processes of _____ and _____ generate variation and _____ produces adaptation to the environment.
- (a) sexual selection; natural selection; mutation (b) mutation; sexual recombination; genetic drift
(c) genetic drift; mutation; sexual recombination (d) mutation; sexual recombination; natural selection
77. Directional selection:
- (a) works against adaptive traits (b) favours intermediate forms of a trait
(c) eliminates uncommon forms of alleles (d) shifts allele frequencies in a steady, consistent direction
78. Adaptation of a species is its:
- (a) acquired character (b) ecdysis (c) hereditary character (d) metamorphosis
79. The unit of natural selection is:
- (a) family (b) species (c) individual (d) population
80. Select the correct statement(s).
- A. The essence of Darwinian theory about evolution is natural selection.
B. The rate of appearance of new forms is not linked to the life cycle or the life span. , ,
C. Adaptive ability is not inherited
D. Mutation is random and directionless
- (a) B and C (b) A and D (c) None (d) All
81. Jurassic period of the Mesozoic era is characterized by:
- (a) gymnosperms are dominant plants and first birds appear
(b) radiation of reptiles and origin of mammal like reptiles
(c) dinosaurs become extinct and angiosperms appear
(d) flowering plants and first dinosaurs appear
82. Species is:
- (a) population of one type
(b) a group of interbreeding populations
(c) a group of individuals inhabiting a geographical area
(d) populations of individuals having same genotypes and phenotypes
83. Which one(s) is / are correct -

- (a) Directional selection favours one extreme form over the other extreme and over intermediate forms of a trait.
- (b) Stabilizing selection favours intermediate forms of a trait
- (c) Disruptive selection favours both extreme forms of a trait.
- (d) All of the above

84. Which of the followings is / are incorrect about Neanderthal man?

- A. had large brain around 900 c.c
- B. lived in near east and central Asia between 100000 - 40000 years back
- C. used hides to protect their body and buried their dead.
- D. had no religious feeling

- (a) All (b) None (c) A and D (d) B and C

85. The sequence of origin of life may be-

- (a) Inorganic materials → organic materials → colloidal aggregate → Eobiont → cell.
- (b) Organic materials → Inorganic materials → colloidal aggregate; Eobiont → cell
- (c) Inorganic materials → organic materials; Eobiont → cell → colloidal aggregate.
- (d) Organic materials → Inorganic materials; Eobiont → cell; colloidal aggregate.

86. Match the Column I with Column II - **Column I**

- I. Human embryos have gill
- II. Oparin and Haldane
- III. Miller and Urey
- IV. Analogous organs

- (a) I.-C, II.-D, III.-B, IV.-A
- (c) I.-D, II.-A, III.-B, IV.-C

Column II

- A. Chemical evolution
- B. Stimulation experiment
- C. Wings of bird and butterfly
- D. Outgroup repeats phylogeny

- (b) I.-B, II.-A, III.-D, IV. -C
- (d) I.-D, II.-A, III.-C, IV.-B

87. Match the Column I with Column II-

Column I

- I. Darwin
- II. De Vries
- III. Pasteur
- IV. Lamarck

- (a) I.-C, II.-D, III.-B, IV.-A
- (c) I.-D, II.-A, III.-B, IV.-C

Column II

- A. Inheritance of acquired character
- B. Swan-Necked
- C. Natural Selection and origin of species
- D. Mutational theory

- (b) I.-B, II.-A, III.-D, IV. -C
- (d) I.-D, II.-A, III.-C, IV.-B

88. Given below are two statements each with one or more blanks. Select the option which correctly fills up the blanks in the statements.

Statements:

In a mixed population, those that can better-adapt, ____ (i) ____ and increase in population size. No variant is ____ (ii) ____ wiped out. Similarly, excess use of herbicides, pesticides, etc., has only resulted in selection of resistant varieties in a much ____ (iii) ____ time scale. This is also true for microbes against which we employ antibiotics or drugs against eukaryotic organisms/cell. Hence, resistant organisms/cells are appearing in a time scale of months or years and not centuries. These are examples of evolution by (iv) ____ action. This

also tells us that evolution is not a (v) process in the sense of determinism. It is a (vi) process based on chance events in nature and chance (vii) in the organisms.

- (a) (i)-survive, (ii)completely, (iii) lesser, (iv)anthropogenic, (v) direct, (vi)stochastic, (vii) mutation
- (b) (i) - survive, (ii) completely, (iii) lesser, (iv) anthropogenic, (v) indirect, (vi) stochastic, (vii) mutation
- (c) (i) - survive, (ii) completely, (iii) more, (iv) anthropogenic, (v) direct, (vi) stochastic, (vii) mutation
- (d) (i) - survive, (ii) incompletely, (iii) lesser, (iv) anthropogenic, (v) direct, (vi) stochastic, (vii) mutation

89. Which is-the correct chronological sequence of human evolution -

- (a) Dryopithecus -» Ramapithecus -» Australopithecus -» Homohabilis -» H. erectus -> Cro-magnon -> H. sapiens
- (b) Ramapithecus -» Australopithecus -> Homohabilis -> H. erectus -> Cro-magnon -» Dryopithecus -> H. sapiens
- (c) Dryopithecus -> Ramapithecus -» Homohabilis -» H. erectus -» Cro-magnon -» Australopithecus -> H. sapiens
- (d) Dryopithecus ->• Ramapithecus -» H. sapiens -> Australopithecus -» Homohabilis —> H. erectus -> Cro-magnon

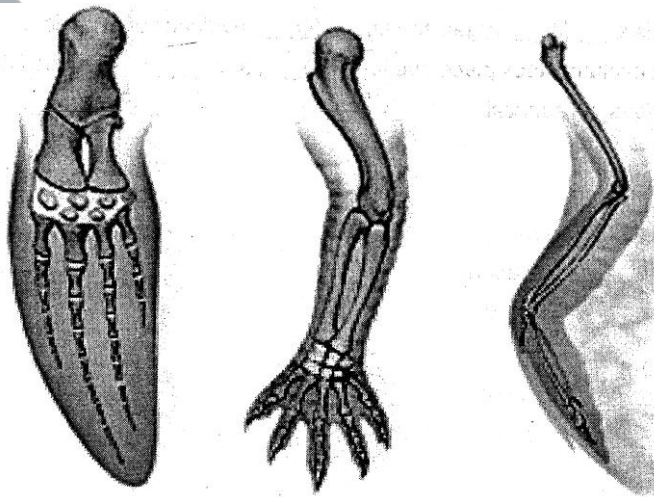
90. According to the Hardy-Weinberg's equation $p^2 + 2pq + q^2$ should be equal to _____.

- (a) 1 (b) 2 (c) 0 (d) 3

91. Which of the following statements is true about Charles Darwin?

- (a) He believed that evolution was due to the inheritance of acquired characteristics.
- (b) He supported Lamarck's explanation of how evolution occurred.
- (c) He understood that the variation that exists in natural populations of plants or animals is the result of repeated mutations.
- (d) none of the above

92. What can you infer about these structures?



- (a) they are homologous
- (b) they are vestigial structures
- (c) they are analogous
- (d) they have nothing to do with each other

93. Which of these statements is true?

Comparison of Country and City Moths			
Location		Numbers of Light Moths	Numbers of Dark Moths
Country	Released	496	488
	Recaptured	62	34
City	Released	137	493
	Recaptured	18	136

- (a) A higher percentage of light moths were recaptured in the city compared to dark moths recaptured in the city.
- (b) A higher percentage of dark moths were recaptured in the country compared to dark moths recaptured in the city.
- (c) A higher percentage of light and dark moths were recaptured in the country compared to light and dark moths recaptured in the city.
- (d) A higher percentage of light moths were recaptured in the country compared to dark moths recaptured in the country

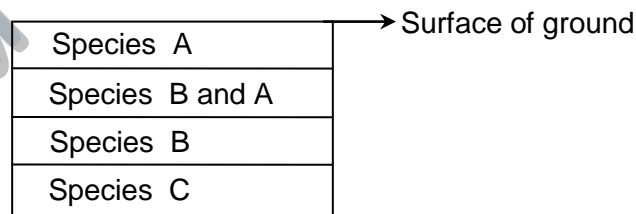
94. The following are some major events in the early history of life-

- P. first heterotrophic prokaryotes
 Q. first genes
 R. first eukaryotes
 S. first autotrophic prokaryotes
 T. first animals

Which answer below places these events in the correct order ?

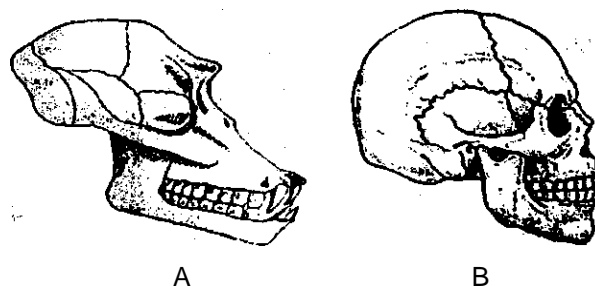
- (a) PQSRT (b) QSPTR (c) QPSRT (d) QSPRT

95. The diagram below represents a section of undisturbed layers of sedimentary rock in New York State and shows the location of fossils of several closely related species. According to currently accepted evolutionary theory, which is the most probable assumption about species A, B, and C?



- (a) Species B is more abundant than species C (b) Species C existed before species B
- (c) Species A and B are genetically identical (d) Species B descended from species A.

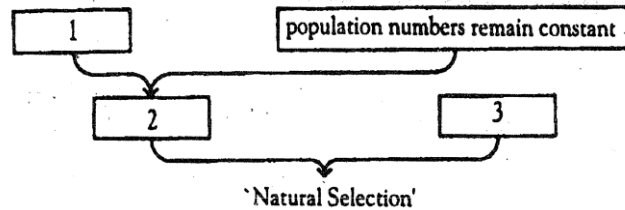
96. The illustration below shows the skull of two different mammals. Use the illustration to answer the question that follows



Which of the following accurately describes the differences between these skulls?

- (a) Skull A has more teeth than skull B
- (b) Skull A has more brain capacity than skull B
- (c) Skull A is of a primate and skull B is not of a primate
- (d) Skull A is the skull of an ape and skull B is the skull of human

97. The diagram shows 3 summary of Darwin's theory of natural selection.



Which statements should be placed in boxes 1, 2 and 3?

There is a struggle for existence

Variation is shown in all populations

Individuals show great reproductive capacity

- | | | | |
|-----|---|---|---|
| (a) | 1 | 2 | 3 |
| (b) | 2 | 1 | 3 |
| (c) | 2 | 3 | 1 |
| (d) | 3 | 1 | 2 |

98. Three forms of the peppered moth, *Biston betularia*, namely the melanic form, the pale form, and a form intermediate between these two, are found in Britain today.

The melanic form was first observed in 1848 and its frequency subsequently increased. This is thought to be the result of

- (a) adaptive radiation.
- (b) convergent evolution.
- (c) divergent evolution.
- (d) natural selection.

99. Which of the following are the examples of adaptive radiation?

A. Wombat, marsupial rat, Flying phalanges

B. Darwin's finches

C. Different placental mammals in Australia

D. Placental wolf and Tasmanian wolf

- (a) A only
- (b) A & B only
- (c) A, B & C only
- (d) A, B, C & D

(d) increased tolerance of lichens to heavy metals on tree bark around mine workings ••>

100. An example of process of evolution of different species in a given geographical area starting from a common ancestor and radiating to other areas of geography can be

(a) Origin of *Numbat*, *Phascogale*, Flying phalanges, Tasmanian wolf, Spotted cuscus from a primitive metatherian

(b) Origin of *Eohippus*, *Meshippus*, *Parahippus* and *Pliohippus*

(c) Origin of *Homo erectus*, *Homo neanderthalensis*, *Homo sapiens fossils*, *Homo sapiens sapiens*

(d) Origin of *Biston betularia* from *Biston carbonaria*

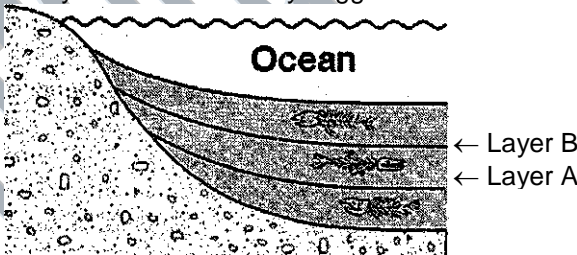
101. An inter-breeding population of finches became separated geographically, forming two isolated groups. Each group then became subject to different selective pressures. One group was then introduced into the habitat of the other.
- Which one of the following would determine whether they now formed two distinct species?
- They had been separated for more than three million years.
 - They failed to produce fertile F_1 hybrids.
 - They showed marked differences in the shape of their beaks.
 - Their plumage had become markedly different.
102. What is true regarding industrialization in England
- The white-winged moths were completely wiped out after industrialization
 - Since lichens did not grow in polluted area, the number of melanized moths got reduced
 - After industrialization the white-winged moths did not survive due to predators
 - All of these
103. A potential danger to a population that has been greatly reduced in number is the-
- loss of genetic variability
 - tendency toward assortative mating
 - reduced gene flow
 - Hardy-Weinberg disequilibrium
104. Which of the following ways is most likely to decrease the genetic diversity in a population?
- Gene mutation
 - Genetic recombination
 - Stabilizing natural selection
 - Immigration of individuals
105. Mark the incorrect statement
- The fitness of the individuals, according to Charles Darwin, means reproductive fitness
 - Homology in vertebrates' brain indicates their common ancestry
 - The idea of survival of fittest of Alfred R Wallace was based on his studies
 - All of these
106. Ancient mammals enjoyed a release from competition when the dinosaurs became extinct. Should humans work to ensure that such releases from competition continue to occur for us or for other species?
- No, because it is impossible to predict which species will become dominant if other species become extinct
 - No, because the species that become dominant will cause the extinction of humans
 - Yes, because the organisms that are released from competition will always form more new species than the number that went extinct
 - Yes, because new species that evolve are always better organisms than those that went extinct
107. The two key concepts of Darwinian theory of evolution are
- Use and disuse, and inheritance of acquired characters
 - Branching descent and natural selection
 - Branching descent and mutation
 - Reproductive isolation and mutation
108. Australia has unusual organisms because their evolution for the past 38 million years has been
- Rapid
 - Slow
 - Isolated from other organisms
 - Punctuated
109. Which of the following statements are true for genetic drift?
- It upsets the Hardy-Weinberg equilibrium
 - It operates only in small population

- III. It is responsible for preserving certain genes IV. It is responsible for eliminating certain genes
 (a) I, II, III (b) II, III, IV (c) I, II, IV (d) I, II, III, IV
110. The classification of bacterial species does not fit the usual definition of species. This is because bacteria
 (a) Cannot exchange genetic material (b) Are eukaryotic
 (c) Have a high rate of gene flow (d) Reproduce asexually
111. Darwin believed that a giraffe has a long neck because
 (a) a creator designed it that way
 (b) catastrophes eliminated short-necked forms
 (c) its ancestors stretched their necks to get food
 (d) ancestral giraffes with slightly longer necks than others got more food and left more surviving offspring
112. Read the following three statements (A to C) and mark the most appropriate option
 A. The fitness in the 'survival of the fittest' is based upon the characteristics that are inherited
 B. Darwin's variations were small and directional
 C. The fitness is the end result of ability to adapt
 (a) Only A and B correct (b) Only B and C correct (c) Only A and C correct (d) All A, B and C correct
113. Which statement about the rates of evolution for different species is in agreement with the theory of evolution?
 (a) They are identical, since the species live on the same planet.
 (b) They are identical, since each species is at risk of becoming extinct.
 (c) They are different, since each species has different adaptations that function within a changing environment.
 (d) They are different, since each species has access to unlimited resources within its environment.
114. The extinct human who lived 1,00,000 to 40,000 years ago, in Europe, Asia and parts of Africa, with short stature, heavy eyebrows, retreating foreheads, large jaws with heavy teeth, stocky bodies, a lumbering gait and stooped posture was .
 (a) Homo habilis (b) Neanderthal human (c) Cro-magnon humans (d) Ramapithecus
115. The following list includes three Australian marsupial mammals and three placental mammals which occupy similar ecological niches in other continents of the world.
 1. great red kangaroo 2. flying squirrel 3. sloth 4. phalanger
 5. koala bear 6. deer
 Which of the following correctly pairs each marsupial with the equivalent placental?
 (a) 1 & 6, 4 & 3, 5 & 2 (b) 1 & 3, 4 & 2, 5 & 6 (c) 1 & 2, 4 & 3, 5 & 6 (d) 1 & 6, 4 & 2, 5 & 3
116. An Australian mole is actually a marsupial rather than a placental mammal like the North American or European mole. The two animals are similar in appearance because
 (a) There are practically no placental mammals in Australia
 (b) The selection pressures on both were similar
 (c) They have undergone a long period of coevolution
 (d) Marsupials and placental mammals are closely related
117. The biologist who has been called the "Darwin of the 20th century", was
 (a) Linnaeus (b) Ernst Mayr (c) Diener (d) Whittaker.
118. The tendency of population to remain in genetic equilibrium may be disturbed by-
 (a) Lack of migration (b) Lack of mutations (c) Lack of random mating (d) Random mating

119. Which statement best illustrates a rapid biological adaptation that has actually occurred?
- Pesticide-resistant insects have developed in certain environments.
 - Scientific evidence indicates that dinosaurs once lived on land.
 - Paving large areas of land has decreased habitats for certain organisms.
 - The characteristics of sharks have remained unchanged over a long period of time.
120. Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as
- Genetic drift
 - Random mating
 - Genetic load
 - Genetic flow
121. Many animals exist today in a form that is almost identical to the form they had a million years ago. What is the most probable explanation for this lack of evolutionary change?
- Genetic mutations have occurred among the animals.
 - The environment of these animals remained about the same.
 - These animals reproduce by sexual reproduction.
 - Complex organisms evolved into simpler ones.
122. The process by which organisms with different evolutionary history evolve similar phenotypic adaptations in response to a common environmental challenge, is called-
- Convergent evolution
 - Non-random evolution
 - Adaptive radiation
 - Natural selection
115. Which statement is best supported by fossil records?
- Many organisms that lived in the past are now extinct.
 - Species occupying the same habitat have identical environmental needs.
 - The struggle for existence between organisms results in changes in populations.
 - Structures such as leg bones and wing bones can originate from the same type of tissue found in embryos.
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124. Scientists believe that over millions of years, Australian mammals have become very different from other mammals as a direct result of
- Evolving pouches in which to rear their young
 - Following their own course of evolution in isolation
 - Developing reproductive systems homologous to placental
 - Evolving in climatically unique ecosystems
125. Biogenetic law as given by Haeckel states that
- ontogeny recapitulates phylogeny
 - phylogeny recapitulates ontogeny
 - ontogeny and phylogeny go together
 - there is no relationship between phylogeny and ontogeny.
126. Which one of the following options gives one correct example each of convergent evolution and divergent evolution?
- | Convergent evolution | Divergent evolution |
|--|-----------------------------------|
| (a) Eyes of octopus and mammals | Bones of forelimbs of vertebrates |
| (b) Thorns of Bougainvillea and tendrils of <i>Cucurbita</i> | Wings of butterflies and birds |

- (c) Bones of forelimbs of vertebrates Wings of butterfly and birds
 (d) Thorns of Bougainvillia and tendrils of *Cucurbita* Eyes of Octopus and mammals
127. The eye of octopus and eye of cat show different patterns of structure, yet they perform similar function. This is an example of-
- (a) Homologous organs that have evolved due to divergent evolution
 (b) Analogous organs that have evolved due to convergent evolution
 (c) Analogous organs that have evolved due to divergent evolution
 (d) Homologous organs that have evolved due to convergent evolution
128. You are shown a skull from one of the *Australopithecus* species. How can you tell that is not from a modern human?
- (a) Age (b) Shape and Size (c) Type of teeth (d) All of the above
129. Early mammals were
- (a) Small (b) Large (c) Monkeys (d) Human
130. The origin of mammal like reptiles occurred in
- (a) Triassic period (b) Permian period (c) Jurassic period (d) tertiary period.
131. Which situation would most likely result in the highest rate of natural selection?
- (a) reproduction of organisms by an asexual method in an unchanging environment
 (b) reproduction of a species having a very low mutation rate in a changing environment
 (c) reproduction of organisms in an unchanging environment with little competition and few predators
 (d) reproduction of organisms exhibiting genetic differences due to mutations and genetic recombinations in a changing environment
132. Differences between the members of a population will most likely be passed to future generations if they are
- (a) due to genetic changes and result in unfavorable variations
 (b) due to genetic changes and result in favorable variations
 (c) not due to genetic changes and result in unfavorable variations
 (d) not due to genetic changes and result in favorable variations
133. Your measurements indicate that a fossilized skull you unearthed has a ^{14}C -to- ^{12}C ratio about one-sixteenth that of the atmosphere. What is the approximate age of the skull?
- (a) 22,400 years (b) 11,200 years (c) 5600 years (d) 200,000 years
134. A large population of cockroaches was sprayed with a newly developed, fast-acting insecticide. The appearance of some cockroaches that are resistant to this insecticide supports the concept that
- (a) species traits tend to remain constant
 (b) insecticides cause mutations
 (c) the environment does not change
 (d) variation exists within a species
135. Which word does not describe humans?
- (a) Ape (b) Mammals (c) Amphibian (d) Primate
136. If the Neanderthals are not the direct ancestors of humans, is it still possible for humans and Neanderthals to be related?

- (a) Yes, because we share a common ancestor
 (b) Yes, but only if humans and Neanderthals could have interbred
 (c) No, because the human evolutionary tree is strictly linear and without branches
 (d) No, because this means that Neanderthals evolved from an entirely different branch of organisms than humans did
137. The first vertebrates to colonize land were
 (a) Birds (b) Mammals (c) Amphibians (d) Reptiles
138. Mark the correct statement
 (a) *Homo erectus* lived in east and central Asia and used hides to protect their bodies
 (b) Agriculture came around 18000 years back
 (c) The skull of modern human resembles more closely to baby chimpanzee than to adult chimpanzee
 (d) All of these
139. Which of the following factor does not affect Hardy-Weinberg's equilibrium
 (a) Gene migration (b) Natural selection
 (c) Genetic drift (d) Replication of genetic material
140. Which of the following statements would Darwin most likely disagree?
 (a) Individuals within a population vary in the characteristics they possess
 (b) Evolution is best viewed as a purposeful and directed change over time
 (c) Natural selection is the mechanism by which biological evolution takes place
 (d) The fossil record supports the view that biological evolution has occurred
141. According to Darwin, two different areas within a continent have different species because they have different
 (a) evolutionary mechanisms (b) ancestors
 (c) environments (d) evolutionary times
142. The most apparent change during the evolutionary history of *Homo sapiens* is traced in
 (a) Loss of body hair (b) Walking upright
 (c) Shortening of the jaws (d) Remarkable increase in the brain size
143. Being the hominid, the first human like creature was called
 (a) *Australopithecus* (b) *Homo habilis* (c) *Homo erectus* (d) Neanderthal man
144. Genetic drift occurs when a few individuals of a species colonize an island. This particular phenomenon is known as-
 (a) The bottleneck effect (b) The founder effect (c) Assortative mating (d) Random mating
145. Mendel described the frequency ofI.....for the offspring of a singleII.....; Hardy and Weinberg described the frequency ofIII..... for an entireIV.....
 (a) I-phenotypes; II-mated pair; III-alleles; IV-population
 (b) I-genotypes; II-mated pair; III-alleles; IV-population
 (c) I - genomes; II - mated pair; III - alleles; IV - community
 (d) I - phenocopies; II - mated pair; III - alleles; IV - genocopies
146. The peppered moth *Biston betularia* with dull gray or white colour was abundant in England before industrial revolution. During post industrialization period, the tree trunks became dark due to smoke and soot and the black coloured variants of the moth became more abundant. The black color of the moths was due to

- (a) Deposition of soot on the tree trunks
 (b) Recessive mutation
 (c) Dominant mutation
 (d) Deposition of soot on the white wings of moths which changed into dark winged, melanized forms
147. Which of the following is correct ?
 (a) The skull of adult chimpanzee is more like adult human skull than baby chimpanzee skull
 (b) The skull of baby chimpanzee is more like adult human skull than adult chimpanzee skull
 (c) The Alfred Wallace, a naturalist worked in Malay Archipelago come to same conclusions as Darwinism.
 (d) Both b and c
149. Presence of gills in the tadpole of frog indicates that-
 (a) Fishes were amphibious in the past
 (b) Fishes evolved from frog like ancestors
 (c) Frogs will have gills in future
 (d) Frogs evolved from gilled ancestors
149. A baby has been born with a small tail. It is the case exhibiting-
 (a) Metamorphoses
 (b) atavism
 (c) Mutation
 (d) None of these
150. The diagram below shows undisturbed sedimentary strata at the bottom of an ocean. The fossils found in layer B resemble the fossils found in layer A. This similarity suggests that-
- 
- (a) the fossils in layer B were formed before the fossils in layer A
 (b) modern forms of life may have evolved from earlier forms of life
 (c) vertebrate fossils are only found in sediments
 (d) the fossils in layer A must be more complex than those in layer B
151. The sequence of events in geographic speciation is most likely to be -
 (a) Genetic divergence -> geographic barrier -> reproductive isolation
 (b) Geographic barrier -> genetic divergence -> reproductive isolation
 (c) Reproductive isolation -> genetic divergence -> geographic barrier
 (d) Geographic barrier -> reproductive isolation -> genetic divergence
152. Flowers of certain orchids resemble females of certain insects in shape. Mole insects take these flowers as females and try to copulate, but instead these only pollinate the flowers. This process is called-
 (a) mimicry
 (b) Pseudocercupulation
 (c) Pseudopollination
 (d) Pseudopartherocarpy
153. Charles Darwin concluded that the 13 species of finches on the Galapagos Islands:
 (a) were identical to 13 finch species in northwestern South America 600 miles to the east
 (b) probably evolved from one ancestral South American species
 (c) had all adapted to the same food sources
 (d) Band C

154. Which is the correct option of evolutionary history from reptiles to Dinosaurs -
 (a) Early reptiles -> Pelycosaurs -> Synapsids -> Thecodonts -> Therapsids -> Dinosaurs
 (b) Early reptiles —» Synapsids —» Pelycosaurs -> Thecodonts -> Therapsids -> Dinosaurs
 (c) Early reptiles -> Synapsids -> Pelycosaurs -> Therapsids -> Thecodonts —» Dinosaurs
 (d) Early reptiles —» Synapsids -> Thecodonts -> Pelycosaurs -> Therapsids —» Dinosaurs
155. Homoerectus-
 A. had a large brain around 900 c.c. B. probably ate meat.
 C. appeared about 1.5 mya year ago D. evolved from *H. habilis*.
 (a) A and B (b) B and C (c) None (d) All
156. A. Amphibians evolved into reptiles.
 B. Fish with stout and strong fins could move on land and go back to water. This was about 350 mya.
 C. Giant ferns were present but they all fell to form coal deposits slowly
 C. About 65 mya (in cretaceous period) the dinosaurs suddenly disappeared from the earth.
 D. Archeopteryx is the connecting link between birds and reptiles.
 (a) All are correct (b) All are incorrect (c) C and D are correct (d) A and B are correct.
157. Select the correct statement(s).
 A. Microbial experiment show the pre-existing advantageous mutations when selected will result in the observation of new phenotypes. Over few generation this would result in speciation.
 B. Neanderthal fossils represent a human relative.
 C. In 1938, a fish caught in South Africa happened to be a coelacanth (lobe fins) which was thought to be extinct. These animals evolved into the first amphibian living on both land and water.
 D. Lichens can be used as water pollution indicators.
 E. Alfred Wallace, a naturalist, who worked in Malay Archipelago (present Indonesia) has also come to similar conclusion on natural selection as reached by Darwinism.
 (a) A and B only (b) A, B, C and E (c) C and D only (d) D and E only
158. Which of the following are necessary for evolution by natural selection to take place?
 I. Offspring resemble their parents more than other individuals in the population
 II. Differences among individuals exist and lead to different numbers of successful offspring being produced
 III. Individuals adjust their development depending on the environment
 IV. Every individual has a desire to have many offspring
 V. Populations tend to grow faster than their food supplies
 (a) I and II (b) I and V (c) II, III and IV (d) III and V
159. Existence of coal /petroleum can be known from the study of -
 (a) Ecology (b) Economic Botany (c) Palaeobotany (d) Bacteriology
160. Select the correct statement(s).
 (a) Single-celled organisms evolved slowly into multicellular organisms
 (b) Invertebrate around 500 million years ago
 (c) Jawless fish must have evolved around 350 million years ago.
 (d) All of the above

161. Which one(s) is / are correct?
- (a) Most fossils are found in sedimentary rocks
 - (b) According to Lamarck, a giraffe has a long back because its ancestors stretched their necks to good food.
 - (c) The unit of evolution is population
 - (d) All of the above
162. Arrange the periods of palaeozoic era in ascending order in a geological time scale:
- (a) Cambrian → Ordovician → Silurian → Devonian → Carboniferous → Permian
 - (b) Cambrian →* Devonian → Ordovician → Silurian → Carboniferous →* Permian
 - (c) Cambrian → Ordovician →* Devonian → Silurian → Carboniferous → Permian
 - (d) Silurian → Devonian →^ Cambrian →* Ordovician → Permian →^ Carboniferous
163. A. Fossils are remained of hard parts of life forms in Rock.
B. A study of fossils in different sedimentary layers indicates the geological period in which they live.
C. Radio isotopes are often used to determine the age of the fossils
D. Study of fossils is called palaeontology
- (a) All are correct
 - (b) All are incorrect
 - (c) A, C & D are correct
 - (d) B & D are correct
164. Geographic and reproductive isolations are most closely associated with:
- (a) speciation
 - (b) extinction
 - (c) succession
 - (d) competition
165. Natural Selection -
- A. Tends to increase the characters that enhance survival and reproduction
 - B. Causes adaptation
 - C. Acts on an organisms phenotype.
 - D. Was considered as mechanism of evolution by Darwin.
- (a) All are correct
 - (b) Only A and B are correct
 - (c) Only C and D are correct
 - (d) None is correct
166. Presence of recessive trait is 16%. The frequency of dominant allele in population is:
- (a) 0.6
 - (b) 0.32
 - (c) 0.84
 - (d) 0.92
167. Cause of mimicry is:
- (a) attack (offence)
 - (b) protection (defence)
 - (c) Both
 - (d) None
168. Disruptive selection:
- (a) eliminates uncommon forms of alleles
 - (b) does not favour intermediate forms of a trait
 - (c) shifts allele frequencies in a steady, consistent direction
 - (d) all of the above
169. Adaptations:
- (a) are not common
 - (b) result from genetic drift
 - (c) result from natural selection
 - (d) are features of the organism that hinder its performance in its environment
170. Natural selection is sometimes described as "survival of the fittest". Which of the following most accurately measures an organism's fitness?
- (a) Its mutation rate
 - (b) How many fertile offspring it produces

- (c) How much food it is able to make or obtain (d) Its ability to withstand environmental extremes
171. The origin of species from pre-existing species is:
 (a) mutation (b) isolation (c) polyploidy (d) speciation
172. Birds with average-sized wings survived in a severe storm more successfully than with longer or shorter wings. It illustrates:
 (a) stabilizing selection (b) gene flow (c) diversifying selection (d) founder effect
173. Which of the following must take place for speciation to occur?
 (a) Hybridization (b) Geographic isolation (c) Polyploidy (d) Reproductive isolation
174. Industrial melanism is related to -
 (a) Skin darkening due to smoke (b) Drug resistance
 (c) Defence against UV radiations (d) Protective resemblance to surroundings
175. In a population of frogs which would be considered the fittest?
 (a) The biggest frog (b) The strongest which can eat maximum
 (c) The frog that leaves the most descendants (d) The frog having largest number of mutations
176. Genetic drift / Sewell wright effect is a _____ process.
 (a) random (b) directed (c) revolutionary (d) uniformitarian
177. In a population where competition between individuals is severe then the distribution is said to be -
 (a) uniform (b) random (c) irregular (d) non-random
178. The change of lighter coloured variety of peppered moth, Biston betularia, to its darker variety (carbonaria) is due to:
 (a) deletion of a segment of genes due to industrial pollution
 (b) mutation of single Mendelian gene for survival in smoke laden industrial environment
 (c) industrial carbon deposited on the wings of the moth resulting in darker variety
 (d) translocation of a block of genes in chromosomes in response to heavy carbons
179. The phenomenon of "Industrial melanism" demonstrates:
 (a) natural selection (b) induced mutation (c) reproductive isolation (d) geographical isolation
180. Which is basis of evolution?
 (a) Cell (b) Species (c) Individual (d) Population
181. The organisms separated by geographical barriers are termed:
 (a) allopatric (b) sibling (c) neopatric (d) sympatric
182. In natural selection:
 (a) new mutations are generated over time
 (b) the genetic composition of the population changes at random overtime
 (c) all individuals in a population are equally likely to contribute offspring to the next generation
 (d) individuals that possess particular heritable characteristics survive and reproduce at a higher rate than other individuals
183. Using imprints from a plate with complete medium and carrying bacterial colonies, you can select streptomycin resistant mutants and prove that such mutations do not originate as adaptation, these imprints need to be used:
 (a) on plates with minimal medium (b) only on plates with streptomycin
 (c) only on plates without streptomycin (d) on plates with and without streptomycin

184. Match following evolution concepts in List-I with List-II and select the correct answer using the codes given below the lists:
- | List I | List II |
|----------------------|--|
| A. Mutation | 1 changes in population's allele frequencies due to chance alone |
| B. Gene flow | 2 differences in survival and reproduction among variant individuals |
| C. Natural selection | 3 immigration, emigration change allele frequencies |
| D. Genetic drift | 4 Source of new alleles |
- (a) A=1, B=2, C=3, D=4 (b) A=4, B=2, C=3, D=1
(c) A=5, B=1, C=4, D=2 (d) A=4, B=3, C=2, D=1
185. Discovery of which of the following in 1980 predicted the existence of RNA world during early stage in evolution?
- (a) RNA is not found in all cells (b) RNA has enzymatic properties
(c) In some viruses RNA is genetic material (d) m-RNA, t-RNA and r-RNA synthesize proteins
186. Which one of the following phenomena supports Darwin's concept of natural selection in organic evolution?
- (a) Development of transgenic animals
(b) Prevalence of pesticide resistant insects
(c) Production of 'Dolly' the sheep by cloning
(d) Development of organs from 'stem cells' for organ transplantation
187. Theory of pangenesis was proposed by:
- (a) Darwin (b) Hugo de Vries (c) Lamarck (d) Weismann
188. Each of us is part of the ongoing evolution of the species. Which of the following occurrences would have the greatest impact on the future biological evolution of the human population?
- (a) A mutation occurs in one of your sperm or egg cells
(b) You do exercise every day so that you stay physically fit and healthy
(c) You move to Kerala, the state of highest medical facilities and literacy
(d) You encourage your children to develop their intellectual abilities
189. Hugo de Vries pioneered the theory of mutations to explain the mechanism of evolution. Material on which he had experimented was:
- (a) Fruitfly (b) China rose (c) Garden pea (d) Evening primrose
190. Sum of all the genes in a population is called:
- (a) genome (b) gene pool (c) germplasm (d) gene bank
191. In Lederberg's replica experiment what shall be used to obtain streptomycin resistant strain?
- (a) Only minimal medium (b) Only complete medium
(c) Minimal medium and streptomycin (d) Complete medium and streptomycin
192. Modern theory of organic evolution is based on:
- (a) mutation (b) population (c) isolation (d) all of these
193. Who wrote the book 'The Origin of Species'?
- (a) Mendel (b) Wallace (c) Lamarck (d) Darwin
194. Darwin travelled in which ship?
- (a) H.M.S. Eagle (b) Titanic (c) H. M. S. Beagle (d) D. Matrica
195. Which one provides correct sequence of events in origin of species according to Darwinism?

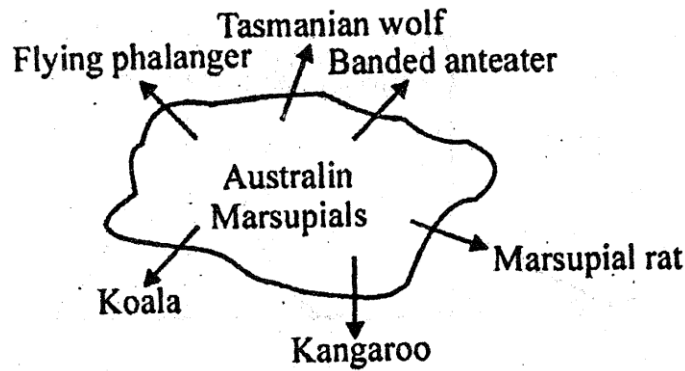
1. Natural selection
3. Survival of fittest
(a) 1,2,3,4 (b) 2, 4, 3, 1 (c) 4, 2, 3, 1 (d) 2, 3,1,4
196. The book "Philosophic Zoologique" was written by:
(a) Hugo de Vries (b) Lamarck (c) Mendel
197. The theory of natural selection of Darwin:
(a) does not explain fossils (b) is completely changed
(c) has the first theory of organic evolution (d) has been failed in explaining origin of variations
198. Survival of fittest is possible due to:
(a) overproduction (b) favourable variations
(c) environmental changes (d) inheritance of acquired characters
199. According to Lamarckism, long necked giraffes evolved because:
(a) nature selected only long necked ones
(b) humans preferred only long necked ones
(c) short necks suddenly changed into long necks
(d) of stretching of necks over many generations by short necked ones
200. The book 'The Origin of Species' was published in:
(a) 1809 (b) 1859 (c) 1858 (d) 1956
201. Which of the following evidences does not favour the Lamarckian concept of inheritance of acquired characters?
(a) Absence of limbs in snakes (b) Melanization in peppered moth
(c) Presence of webbed toes in aquatic birds (d) Lack of pigment in cave-dwelling animals
202. Some bacteria are able to grow in streptomycin containing -medium due to:
(a) genetic drift (b) natural selection (c) induced mutation (d) reproductive isolation
203. Hugo de Vries gave his mutation theory on organic evolution while working on:
(a) *Althea rosea* (b) *Pisum sativum* (c) *Oenothera lamarckiana* (d) *Drosophila melanogaster*
204. Which of the following could not be explained by the 'Darwin's Natural Selection Theory'?
(a) Giraffe has long neck and long legs
(b) Retention of characters of no use or vestigial organ
(c) In a forest, numerous young trees grow below the parent trees but many of them perish
(d) Presence of Tasmanian wolf only in Tasmania having become extinct from the Australian mainland
205. Prodigy of reproduction in Darwinism refers to:
(a) successful organisms produce numerous offspring (b) every organism produces numerous offspring
(c) only a few individuals are able to reproduce (d) only a few individuals are able to survive
206. Weismann cut off tails of mice generation after generation but tails neither disappeared nor shortened showing that:
(a) Darwin was correct
(b) Mutation theory is wrong
(c) Tail is an essential organ
(d) Lamarckism was wrong in inheritance of acquired characters

207. The pioneers in the field of organic evolution are
 (a) Darwin, Hugo de Vries, Lamarck, Huxley (b) Darwin, Lamarck, Karl Landsteiner, Hugo de Vries
 (c) Lamarck, Karl Landsteiner, Malthus, Hugo de Vries (d) Karl Landsteiner, Hugo de Vries, Darwin
208. Which era could be called the "age of mammals and birds" ?
 (a) Palaeozoic (b) Mesozoic (c) Cretaceous (d) coenozoic
209. The first mammal appeared in:
 (a) Jurassic period (b) triassic period (c) permian period (d) cretaceous period
210. The concept that 'population tends to increase geometrically while food supply increases arithmetically' was put forward by:
 (a) Stuart Mill (b) Adam Smith (c) T. R. Malthus (d) Charles Darwin
211. Which of the following is not a part of Darwin's theory of evolution? >
 (a) Genetic drift (b) Natural selection (c) Survival of the fittest (d) Struggle for existence
212. Theory of Continuity of Germplasm" was propounded by:
 (a) Darwin (b) Lamarck (c) Gregor Mendel (d) August Weismann
213. The theory of use and disuse of organs was given by:
 (a) Lamarck (b) Darwin (c) Weismann (d) Hugo de Vries
214. Darwin proposed that new species evolve from ancestral forms by the:
 (a) accumulation of mutations
 (b) struggle for limited resources
 (c) inheritance of acquired adaptation to the environment
 (d) gradual accumulation of adaptations to changing environment
215. The idea of "Survival of Fittest" was originally introduced by:
 (a) Malthus (b) Lyell (c) Spencer (d) Darwin
216. The first attempt to solve the problem of mechanism of organic evolution was made by-
 (a) Oparin (b) Darwin (c) Wallace
217. In which of the following periods dinosaurs were maximum developed?
 (a) mesozoic (b) coenozoic (c) palaeozoic (d) proterozoic
218. Mesozoic era is the age of-
 (a) birds (b) fishes (c) reptiles (d) mammals
219. Birbal Sahni was a:
 (a) zoologist (b) ornithologist
 (c) palaeobotanist (d) founder of Central Drug Research Institute (CDRI)
220. Correct order is:
 (a) Palaeozoic → Mesozoic → Coenozoic (b) Mesozoic → Archaeozoic → Proterozoic
 (c) Palaeozoic → Archaeozoic → Coenozoic (d) Archaeozoic → Palaeozoic → Proterozoic
221. Age of fossils in the past was generally determined by radio-carbon method and other methods involving radioactive elements found in the rocks. More precise methods, which were used recently and led to the revision of the evolutionary periods for different groups of organisms includes:
 (a) study of the conditions of fossilization (b) study of carbohydrates/proteins in rocks
 (c) study of carbohydrates/proteins in fossils (d) electron-spin resonance (ESR) and fossil DNA
222. The most direct evidence of organic evolution is:
 (a) fossils (b) embryos (c) morphology (d) vestigial organs

223. Fossils are studied for:
- (a) tracing evolutionary history of organisms (b) studying extinct organisms
(c) providing jobs to scientist (d) both (a) and (b)
224. Fossil X is older than fossil Y because:
- (a) fossil Y was found in deeper sedimentation (b) fossil X was found in deeper sedimentation
(c) fossil Y has some vestigial organs functional in X (d) fossil Y has homologous and analogous organs pi X
225. Which of the following statement is false?
- I. The rules of embryonic development were given by VonBaer.
II. Recapitulation theory was proposed by Haeckel.
III. Haeckel's theory of recapitulation states that ontogeny repeats phylogeny.
IV. Ontogeny recapitulates phylogeny" is the brief definition of Biogenetic law.
- (a) I and II (b) III and IV (c) All (d) None
226. Carbon dating is best suited for determining the age of fossils if their age in years is of the order of-
- (a) 10^3 (b) 104 (c) 10^5 (d) 106
227. All organisms share the same genetic code. This supports that:
- (a) evolution occurs gradually (b) evolution is occurring now
(c) life began a long time ago (d) all organisms are descended from a common ancestor
228. A baby has been born with a small tail. It is case exhibiting:
- (a) atavism (b) mutation (c) metamorphosis (d) retrogressive evolution
229. As evident from fossil records which era had no life?
- (a) Azoic (b) Palaeozoic (c) Coenozoic (d) Proterozoic
230. Appearance of profuse hairs on the body and face of iris dogman is an example of
- (a) atavism (b) mutation
(c) recapitulation theory (d) retrogressive metamorphosis
231. What conclusion is drawn about stratification of a fossil?
- (a) Upper strata are recent and lower are older (b) Reverse of (a)
(c) No stratification takes place : (d) None of the above
232. The type of fossil where hard parts like bones, teeth or trunk of trees are preserved:
- (a) mould (b) petrification (c) compression (d) pseudofossil
233. Fossil remains of Archaeopteryx indicates that:
- (a) it was a flying reptile from Permian period (b) it was a flying reptile from Triassic period
(c) reptiles gave rise to birds during Jurassic period (d) reptiles gave rise to birds during Permian period
234. Examples of vestigial organs in the human body are: -
- (a) wisdom tooth, coccyx, vermiform appendix, nail
(b) coccyx, wisdom tooth, vermiform appendix, auricular muscles
(c) coccyx, vermiform appendix, wisdom tooth, pancreas
(d) auricular muscles, coccyx, nail, wisdom tooth
235. The evidence for the origin of birds from reptiles is the presence in them of:

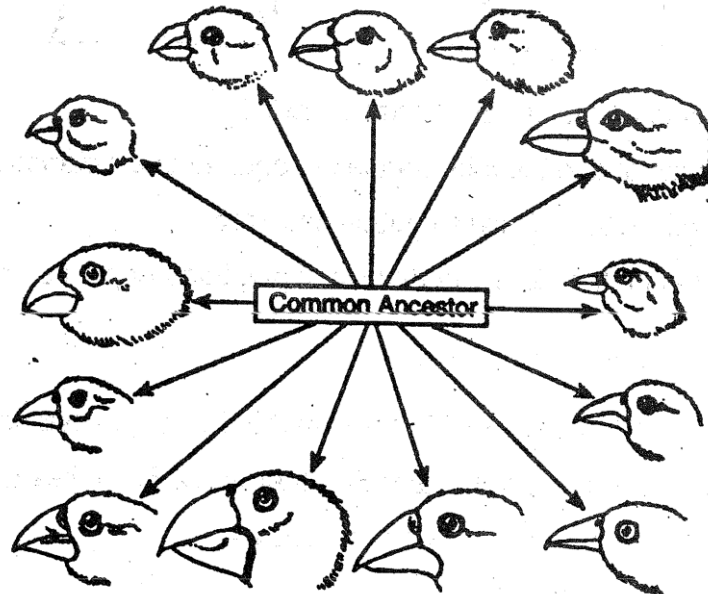
- (a) hairs (b) claws (c) scales (d) feathers
236. Thorn of *Bougainvillea* and tendril of *Cucurbita* are examples of:
 (a) vestigial organs (b) analogous organs (c) homologous organs (d) retrogressive evolution
237. Which of the following pairs is correct?
 (a) Bats wing and insect wing are analogous
 (b) Seal flippers and bats paw are homologous
 (c) Insect wing and bird wing are homologous
 (d) Thorn of Bougainvillea and tendril of pea are analogous
238. Although all mammals whale, dolphin, bat, monkey and horse have some important common characters, but they also show conspicuous differences. This is due to the phenomenon of.
 (a) divergence (b) genetic drift (c) convergence (d) normazation
239. Which of the following are homologous organs?
 (a) Hand of man, wings of bat (b) Eyes of man, eyes of squid
 (c) Gills of fish, lungs of man (d) Leaf of moss, frond of fern
240. Homology does not refer to:
 (a) divergent evolution (b) common descent (c) convergent evolution (d) adaptive radiation
241. Hand of man, wing of bat and flipper of sea, represent:
 (a) vestigial organs (b) analogous organs (c) evolutionary organs
242. The organs of different species that are related to each other through common descent though becomes functionally different are called:
 (a) vestigial (b) analogous (c) homologous. (d) none of these
243. Parallelism is adaptive:
 (a) divergence (b) convergence of closely related groups
 (c) divergence of widely separated species (d) convergence of widely different species
244. Darwin saw that populations of Galapagos finches:
 (a) are adapted to different Island habitats (b) resemble birds in South America
 (c) show variation in traits (d) all of the above
245. What is evolution?
 (a) Development of a cell from chemicals (b) Development of organism through time
 (c) Development of DNA from nucleotides (d) None of the above
246. Diversity of living organisms is due to:
 (a) mutation (b) gradual changes
 (c) long term evolutionary change (d) short term evolutionary change
247. Organic evolution means:
 (a) history of race (b) development of race
 (c) progressive development of race (d) history and development of race with variations
248. Darwin's finches provide an excellent evidence in favour of evolution, this evidence comes from the field of.
 (a) anatomy (b) biogeography (c) embryology (d) palaeontology
249. Fossil evidence of evolution is called:
 (a) anatomy (b) embryology (c) palaeontology (d) biogeography

250. Natural selection theory was proposed by Darwin along with:
 (a) Wallace (b) Mendel (c) Morgan (d) Lamarck
251. The concept of "biological species" was proposed by:
 (a) Darwin (b) Mayr (c) von Baer (d) Linnaeus
252. Evolution-
 A. Is descent with modification.
 B. Is gradual for Darwin
 C. Is a change, in the frequency of an allele within a population, caused by differential reproduction in response to local environmental conditions.
 D. Is irreversible
 (a) A and B are correct (b) C and D are correct (c) All are correct (d) None are correct
253. *Psilophyton* gave the origin to -
 A. Horsetails B. Ferns C. Ginkgo D. Coniferales
 (a) A and B (b) C and D (c) All are correct (d) None
254. The organism which possesses characteristics of both plants and animals and hence, regarded a connecting link between these in-
 (a) Amoeba (b) Entamoeba (c) Euglena (d) Paramecium
255. The first vascular plant were represented by an extinct group
 (a) Bryophytes (b) *Rhynia* (c) Lycopods (d) Cycads
256. The origin of angiosperms took place during -
 (a) Mesozoic era (Cretaceous period) (b) Protozoic era
 (c) Coenozoic era (d) Palaeozoic era
257. First organisms that invaded land were
 (a) Herbivores (b) Carnivores (c) Plants (d) Consumers
258. All are true regarding the genetic drift except -
 (a) It mostly occurs in smaller populations
 (b) Certain alleles can be lost for ever because of genetic drift.
 (c) Founder effects and bottleneck effects are causes of genetic drift.
 (d) Mutations are primary responsible for genetic drift.
259. Which one(s) is / are correct?
 A. Thomas Malthus is well known for his book on populations
 B. The work of Thomas Malthus on population did not influence Darwin
 C. There must be a genetic basis for getting selected and to evolve
 D. All the finches on the Galapagos islands are descended from a common ancestor
 (a) All (b) All except b (c) C and D only (d) None
260. Which one(s) is / are correct of *Australopithecus*?
 A. They lived in East African grassland B. They hunted with stone weapons
 C. They essentially ate fruits
 D. They were transitional stages between the apes and humans
 (a) A and B (b) C and D (c) None (d) All
261. Following diagram provides an example of



- (a) Convergent evolution (b) Parallel evolution (c) Recapitulation (d) Divergent evolution

262. The diversity within the wild bird species in the diagram below can best be explained by which process?



- (a) Natural selection (b) Ecological succession (c) Adaptive radiation (d) Both a and c

263. Genetic drift is a random change in allele frequencies. Sometimes, the change in allele frequencies is so different that the new sample of population becomes a different species. This is known as

- (a) Founder's effect (b) Divergent evolution (c) Parallel evolution (d) Stasigenesis

264. Which of the following has evolved mainly as a result of artificial selection?

- (a) darker colouring of the peppered moth near industrial areas
 (b) increased production of antibiotics by the fungus *Penicillium sp.*
 (c) increased resistance of houseflies to the insecticide DOT
 (d) increased tolerance of lichens to heavy metals on tree bark around mine workings

265. Assume that allele C occurs at 60 percent of the loci and allele c at 40 percent of the loci for a particular gene in a population. Assuming Hardy-Weinberg equilibrium, the frequency of genotype C/C in the next generation will be I _____; the frequency of genotype C/c will be II _____; and the frequency of genotype c/c will be ...iii

- (a) I - 0.26; II - 0.38; III - 0.8
 (b) I - 0.18; II - 0.24; III - 0.8
 (c) I - 0.48; II - 0.36; III - 0.16
 (d) I - 0.36; II - 0.48; III - 0.16

266. An isolated population of humans, with approximately equal numbers of blue-eyed and brown-eyed individuals, was decimated by an earthquake. Only a few brown-eyed people remained to form the next generation. This kind of change in the gene pool is called -

- (a) Hardy-Weinberg equilibrium (b) Block gene flow
 (c) Bottleneck effect (d) Founder effect

267. What was the most significant trend in the evolution of modern man (*Homo sapiens*) from his ancestors?

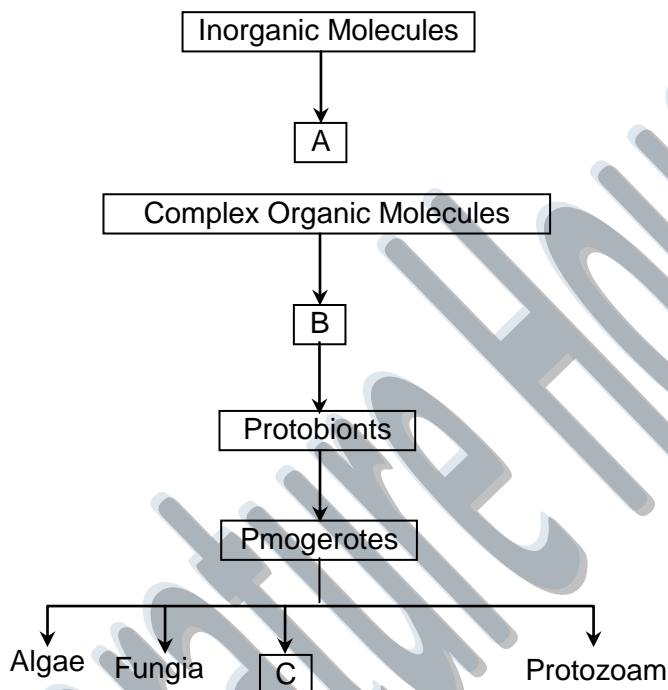
- (a) Increasing brain capacity (b) Upright posture
 (c) Shortening of jaws (d) Binoeufar vision

268. The concept that species have changed over long periods of time is known as

- (a) ecology
(c) spontaneous generation

- (b) embryology
(d) organic evolution

269.



Chose the correct alternatives-

- (a) C-Bacteria, B-Coacervates, A-simple organic molecules
(b) A-Bacteria, B-Simple organic molecules, C-Coacervates
(c) B-Bacteria, B-Coacervates, A- Simple organic molecules
(d) B-Bacteria, A-Coacervates, C- Simple organic molecules

270. The coal deposits were formed by
(a) Pteridophytes (b) Angiosperms (c) Gymnosperms (d) Microflora of sea
271. Read the following three statements (A to C) and mark the right option
A. The thorns in *Bougainvillea* and tendrils in cucurbits represent divergent evolution
B. The similarity in the eyes of *Octopus* and monkeys is the result of convergent evolution
C. The potato and sweet potato are the examples of homology
(a) A and B correct (b) B and C correct (c) A and C correct (d) All A, B and C correct
272. Mark the correct statement/option
(a) Life appeared about 500 M. yrs after the formation of earth
(b) Louis Pasteur believed that life appeared only from preexisting life
(c) Oparin advocated that life came from preexisting non-living organic molecules
(d) All of these
273. Dinosaurs suddenly disappeared from the earth about
(a) 35 million years ago (b) 70 million years ago
(c) 100 million years ago (d) More than 140 million years ago
274. A marsupials evolved from ancestral stock, but all within Austr an continent. This represents
(a) Adaptive radiation like in Darwin's finches (b) Adaptive radiation unlike in Darwin's finches
(c) Convergent evolution like in Darwin's finches (d) Convergent evolution unlike in Darwin's finches
275. The first form of life arise slowly through evolutionary forces from non-living molecules by
(a) Panspermia (b) Biogenesis (c) Abiogenesis (d) Special creation
276. The first true cellular form of life appeared on earth about
(a) 2 million years ago (b) 3 million years ago
(c) 3.5 million years ago (d) 1 million years ago

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	d	a	b	a	c	a	d	a	b	c	c	b	d	c	d	d	a	a	d	d
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	a	c	a	b	c	c	c	c	b	c	c	d	b	a	a	d	d	d	d	c
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	a	a	b	a	c	c	d	b	c	a	c	d	a	d	a	d	a	c	b	c
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	d	c	c	b	b	a	d	a	b	a	b	c	a	c	b	d	d	c	c	b
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	a	b	d	c	a	c	a	a	a	a	d	a	d	c	b	d	c	d	c	a
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	b	c	a	c	c	a	b	c	a	d	d	d	c	b	d	b	b	c	a	a
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	b	a	c	b	a	a	b	b	a	b	d	b	a	d	c	a	c	c	d	b
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	c	d	b	b	b	c	d	d	b	b	b	a	b	b	d	a	b	a	c	d
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	d	a	a	a	a	a	c	b	c	b	b	a	d	d	c	a	d	b	a	d
Ques.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
Ans.	a	d	b	d	b	b	a	a	d	b	d	d	d	c	c	b	d	b	d	b
Ques.	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
Ans.	b	b	c	b	a	d	a	d	b	c	a	d	a	d	d	d	a	c	c	a
Ques.	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
Ans.	d	a	d	b	d	c	d	a	a	a	a	b	c	b	c	c	a	a	a	c
Ques.	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
Ans.	d	c	b	d	b	c	d	b	c	a	b	c	c	c	b	a	c	d	b	d
Ques.	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276				
Ans.	d	d	a	b	d	c	a	d	a	a	a	d	b	a	b	a				

1. An autoimmune disease is
(a) myasthenia gravis (b) haemophilia (c) AIDS (d) none of these.
2. Triple antigen vaccine is not used for
(a) diphtheria (b) pertussis (c) typhoid (d) tetanus.
3. Vaccination of malaria is not possible because
(a) they produce antibodies and antitoxins (b) they do not produce antibodies and antitoxins
(c) antibodies resistant to vaccines are produced (d) none of the above.
4. In malaria, which of the following is released in blood to cause severe chill
(a) hematin (b) haemozoin (c) haemofo'-bin (d) haemolysin
5. Disease which occurs due to malfunctioning of organs is
(a) deficiency disease (b) degenerative disease (c) allergic disease (d) hereditary disease.
6. One of the inflammatory reactions induced by histamines is
(a) vasoconstriction of blood vessels (b) vasodilation of peripheral blood vessels
(c) increased vascular permeability (d) accelerated blood clotting.
7. Which of the following immunoglobulins(Igs) is present in milk?
(a) IgA (b) IgG (c) IgM (d) IgE.
8. Most bacteria ingested with food are killed by ,
(a) cilia and mucus on the lining of the tract (b) stomach acids
(c) the intrinsic factor in the stomach (d) bile in the small intestine.
9. Which of the following blood groups enables a person to give blood to any person?
(a) A⁺ (b) B⁻ (c) AB⁺ (d) Cr
10. The letter T in T-lymphocyte refers to
(a) thalamus (b) tonsil (c) thymus (d) thyroid
11. Lymphocytes that cause the formation of holes in plasma membranes are
(a) B cells (b) killer (cytotoxic) T cells
(c) suppressor! cells (d) helper! cells.
12. Which of the following is a pair of viral diseases?
(a) common cold, AIDS (b) dysentery, common cold
(c) typhoid, tuberculosis (d) ringworm, AIDS
13. Alcohol is mostly metabolised in
(a) liver (b) kidneys (c) all body cells (d) connective tissue.
14. Continued exposure to vinylchloride (VC) may cause cancer to the
(a) vagina (b) skin (c) liver (d) prostate gland.
15. Artificial immunity can be acquired from a
(a) serious illness (b) vaccination
(c) repeated exposure to the same microbe (d) treatment with penicillin.

16. Excessive consumption of alcohol mainly leads to
 (a) state of hallucination (b) loss of memory
 (c) suppression of brain function (d) cirrhosis of liver.
17. The term immunity refers to
 (a) the combined actions of all white blood cells
 (b) events that occur within the lymphatic system
 (c) general defenses against all microorganisms
 (d) specific defenses against microbes encountered during an earlier exposure.
18. Fatty liver syndrome is due to
 (a) cigarette smoke (b) alcoholic drinks (c) opiate narcotics (d) psychedelic drugs.
19. AIDS disease was first reported in
 (a) Russia (b) USA (c) Germany (d) France.
20. Find the incorrect pair out
 (a) Culex — malaria (b) Xenopsylla — plague (c) Aedes — yellow fever (d) Phlebotomus — kala-azar.
21. Sporogony of malarial parasite occurs in
 (a) stomach wall of mosquito (b) salivary glands of mosquito
 (c) RBCs of man (d) liver of man.
22. Which of the following organs is not involved in the generation of immune response?
 (a) brain (b) lymph nodes (c) spleen (d) thymus.
23. Which cells of immune system causes pore formation at the surface of the plasma membrane?
 (a) helper T-cell (b) killer T-cell (c) suppressor T-cell (d) B-cell.
24. An organism which has been used as a weapon in biological war causes which of the following disease?
 (a) malaria (b) common cold (c) influenza (d) anthrax.
25. If a person shows production of interferons in his body, the chances are that he has got an infection of
 (a) typhoid (b) influenza (c) tetanus (d) malaria.
26. The major histocompatibility complex is a
 (a) series of complement-enhanced reactions to antigens
 (b) group of antigens, coded by a family of genes, on the surface of body cells
 (c) form of autoimmunity
 (d) the major cause of cancer.
27. An allergic reaction is initiated by antibodies of the
 (a) IgG group (b) IgM group (c) IgA group (d) IgE group.
28. Perspiration, saliva and tears contains an enzyme, lysozyme, that kills
 (a) virus-infected cells (b) protozoa (c) bacteria (d) viruses.
29. The tobacco products cause
 (a) aneurysm (b) polyarteritis nodosa
 (c) thromboangiitis obliterans (d) Wernicke's syndrome.

30. Which one of the following statements is correct?
 (a) benign tumours show the property of metastasis
 (b) heroin accelerates body functions
 (c) malignant tumours may exhibit metastasis
 (d) patients who have undergone surgery are given cannabinoids to relieve pain.
31. Ganja and LSD are classified in
 (a) stimulants (b) narcotics (c) depressants (d) hallucinogens
32. The regions of an antibody that make it distinct from all other kinds of antibodies are its
 (a) variable (V) regions (b) constant (C) regions (c) mutated (M) regions (d) bifurcated (B) regions. ;
33. Which of the following combinations causes damage to gastric mucosa?
 (a) alcohol & vitamin (b) alcohol & barbiturate (c) alcohol & aspirin (d) alcohol & hashish
34. Persons with severe combined immunodeficiency has no
 (a) interferons (b) macrophages (c) T or B cells (d) functioning lymph nodes.
35. The major phagocytic cells are
 (a) lymphocytes (b) mast cells (c) plasma cells (d) macrophages
36. Lysozyme kills by destroying
 (a) cell walls. (b) mitochondria) enzymes
 (c) lipid bilayers (d) the machinery for DNA replication
37. A person likely to develop tetanus is immunised by administering
 (a) preformed antibodies (b) wide spectrum antibiotics
 (c) weakened germs (d) dead germs
38. Use of anti-histamines and steroids give a quick relief from
 (a) nausea (b) cough (c) headache (d) allergy
39. Blood vessels near a wound dilate and become more permeable in response to which material released from damaged cells?
 (a) pyrogens (b) antibodies (c) histamine (d) interferons.
40. Allergic condition caused by pollen grains of certain flowers causing inflammation of the nose is called
 (a) laryngitis (b) rhinitis (c) pharyngitis (d) bronchitis.
41. Messenger molecules, released by virus-infected cells, that bind to the surfaces of healthy cells and stimulate them to synthesize proteins that prevent viral reproduction are called
 (a) interferons (b) antibiotics (c) cytotoxins (d) lymphokines.
42. Untreated victims of severe combined immunodeficiency usually die from
 (a) infections that in other people are minor (b) anaphylactic shock
 (c) congested lungs (d) unusually high fever.
43. Hypotensive tranquillizer drug reserpine is obtained from roots of
 (a) *Ferula asafoetida* (b) *Rawolfia serpentina* (c) *Papaver somniferum* (d) *Curcuma longa*
44. Naloxone/nalorphine is used as antidote intravenously for overdose of
45. Synthetic, drugs structurally related to adrenaline are
 (a) amphetamines (b) barbiturates (c) hallucinogens (d) analgesics

46. Which one of the following options gives the correct matching of a disease with its causative organism and mode of infection
- | Desease | Causative Organisms | Mode of Infection |
|-------------------|--------------------------|---------------------------------|
| (a) Elephantiasis | Wuchereria bancrofti | With infected water and food |
| (b) Malaria | Plasmodium vivax | Bite of male Anopheles mosquito |
| (c) Typhoid | Salmonella typhi | With inspired air |
| (d) Pneumonia | Streptococcus Pneumoniae | Droplet infection |
47. Heroin is -
- (a) morphine (b) diacetylmorphine (c) stimulant (d), hallucinogen
48. Which one of the following is the correct statement regarding the particular psychotropic drug specified?
- (a) morphine leads to delusions and disturbed emotions
 (b) barbiturates cause relaxation and temporary euphoria
 (c) has his alters thought, feelings, perceptions and hallucinations
 (d) opium stimulates nervous system and causes hallucinations.
49. Charas or hashish is obtained from
- (a) Leaves of Cannabis
 (b) Resinous secretion of flowering tops of female Cannabis
 (c) Dried leaves of female Cannabis
 (d) Resinous secretion from bark of male plants of Cannabis.
50. Amphetamines are central nervous-system stimulants. Barbiturates are
- (a) CNS stimulants (b) no effect on CMS (c) hallucinogenic (d) CMS, depressant
51. Methadone is used for
- (a) narcotic (b) relieving chronic pain
 (c) deaddiction of morphine and heroin (d) all of the above.
52. Use of Cannabis products results in
- (a) alteration in perception, thoughts and feelings
 (b) depressed brain activity and feeling of calmness
 (c) suppressed brain function and relief in pain
 (d) stimulation of nervous system, increased alertness and activity.
- (a) heroin (b) alcohol (c) librium (d) morphine.
53. The effect of opiates is
- (a) numbing of pain causing drowsiness, lethargy and feeling of well being
 (b) reduction of anxiety and tension
 (c) lowering of blood pressure and breathing rate
 (d) all of the above.
54. Heroin is also known by the name
- (a) coke (b) crack (c) smack (d) hemp.

55. Match the Column I with Column II and select the correct

Column I

Column II

(A) LSD

(i) Euphorian effect

(B) Cocaine

(ii) Carinabis

(C) Hashish

(iii) Ergot alkaloid

	A	B	C
(a)	(iii)	(i)	(ii)
(b)	(i)	(ii)	(iii)
(c)	(iii)	(ii)	(i)
(d)	(i)	(iii)	(ii)

which of the following species contain valuable alkaloids that are useful in medicine?

(a) *Azadirachta India* (b) *Rauwolfia serpentine* (c) *Helianthus ahnus* (d) *Emblica officin s*

56. Sedatives differ from tranquillizers in

- (a) sedatives induce sleep while tranquillizers do not do so
- (b). sedatives depress brain activity while tranquillizers activate brain functioning
- (c) sedatives are strong tranquillizers
- (d) sedatives cause addiction while tranquillizers do not produce such an effect.

57. T-cells have a life of

(a) 4-5 days (b) 4-5 weeks (c) 4-5 months (d) 4-5 years.

58. Caffeine can be obtained from

(a) *Thea sinensis* (b) *Coffea arabica* (c) *Theobroma cacao* (d) all of these.

59. A person is drug addict because of

- (a) irritable behaviour, uncoordinated actions and emotional detachment
- (b) habit of taking drug
- (c) irresistible urge to take the drug and increase the dose
- (d) none of the above.

60. Which one of the following depresses brain activity and produces feelings of calmness and relaxation?

(a) morphine (b) V um (c) amphetamines (d) hashish.

61. Which of the following is a hallucinogen?

(a) bhang (b) charas (c) marijuana (d) all of these

62. An autoimmune disease is

(a) rheumatoid arthritis (b) multiple sclerosis /
(c) insulin dependent diabetes (d) all of these.

63. Human immunodeficiency virus (HIV) is comprised of (a protein coat and genetic material, which is

(a) single stranded DMA (b) single stranded RNA (c) double stranded RNA (d) double stranded DNA

64. Hangover is due to accumulation of

(a) ethanol in liver :{b^ethanolin\lufies
(c) acetaldehyde in body (d) formation of formaldehyde from aeetaldehycycle. •

65. Which is an autoimmune disease?

(a) cancer (b) asthma (c) erythroblastosis foet s (d) rheumatoid arthritis

66. Antigen binding site in an antibody is found between
 (a) two light chains
 (b) two heavy chains
 (c) one heavy and one light chain
 (d) either between two light chains or between one heavy and one light chain depending upon the nature of antigen.
67. Which one of the following statements is correct with regard to the principle of safe blood transfusion?
 (a) the donor's red blood corpuscles should not contain antibodies against the recipient's serum
 (b) the recipient's serum should not contain antigens against the donor's antibodies
 (c) the recipient's serum should not contain the antibodies against the red blood corpuscles of the donor
 (d) the recipient's red blood corpuscles should not contain antibodies against the donor's antigen.
68. Damage to thymus in a child may lead to
 (a) a reduction in haemoglobin content of blood
 (b) a reduction in stem cell production
 (c) loss of antibody mediated immunity
 (d) loss of cell mediated immunity.
69. Colostrum provides the infant with
 (a) auto immunity
 (b) passive immunity
 (c) active immunity
 (d) innate immunity
70. The virus that causes acquired immune deficiency syndrome (AIDS) parasitizes reduces
 (a) B cells
 (b) cytotoxic T cells
 (c) helper T cells
 (d) All
71. A person may die after getting a bee sting in his body due to
 (a) toxicity
 (b) coagulation of blood
 (c) anaphylactic shock
 (d) toxicity and coagulation of blood.
72. The humoral immune system defends mostly against bacteria and viruses in the
 (a) body fluids
 (b) digestive tract
 (c) internal organs
 (d) regions beneath the skin.
73. The treatment of snake-bite by antivenin is an example of
 (a) artificially acquired active immunity
 (b) artificially acquired passive immunity
 (c) naturally acquired passive immunity
 (d) specific natural immunity.
74. An immune disease in which the body destroys the ill-functioning thyroid gland itself is
 (a) Simmond's disease
 (b) myxoedema
 (c) Hashimoto's disease
 (d) cretinism
75. The term 'active immunity' means
 (a) increasing rate of heart beat
 (b) increasing quantity of blood
 (c) resistance developed after disease
 (d) resistance developed before disease.
76. The immunoglobulin present in mother's milk is
 (a) IgD
 (b) IgE
 (c) IgM
 (d) IgA
77. Monoclonal antibodies are produced from which type of cells ?
 (a) hybridoma
 (b) multinucleate
 (c) prokaryote
 (d) uninucleate
78. Lymphocytes that inhibit the development and proliferation of T and B cell are
 (a) supressor B cells
 (b) suppressor! cells
 (c) macrophages
 (d) neutrophils
79. White blood cell that are non-specific killers of microbes are
 (a) B cells
 (b) phagocytes
 (c) killerT cells
 (d) helper!cells.

80. Peyer's patches produce
 (a) mucous (b) lymphocytes (c) trypsin (d) enterokinase
81. Recognition and digestion by phagocytosis due to coated surface of antibodies is
 (a) opsonisation (b) immunization (c) T-cell immunization (d) B-cell immunization.
82. The formation of antibodies within our body is called
 (a) passive immunity (b) active immunity (c) innate immunity (d) acquired immunity
83. Kupffer cells are present in
 (a) pancreas (b) thyroid gland (c) liver (d) small intestine
84. Which of the following is observed as No Tobacco Day?
 (a) 1st May (b) 31st May (c) 1st August (d) 31st August
85. Which one of the following provides non-specific pathogen defense for the body?
 (a) T-cells (b) B-cells (c) phagocytes (d) stem cells
86. The common means of transmission of AIDS is
 (a) sexual intercourse (b) blood transfusion (c) placental transfer (d) all of these.
87. Which of these is not a cell of the macrophage system?
 (a) Kupffer cell (b) osteoclasts (c) Langerhans cells (d) astrocyte
88. Which of the following are most abundant types of antibody?
 (a) IgA (b) IgG (c) IgE (d) IgM
89. A patient is suspected to be suffering from Acquired Immuno Deficiency Syndrome. Which diagnostic technique will you recommend for its detection?
 (a) WIDAL (b) ELISA (c) MRI (d) Ultra sound
90. Smoking is harmful as it produces polycyclic aromatic hydrocarbons that cause
 (a) reduction in oxygen transport (b) increase in blood pressure
 (c) cancer (d) retardation of foetus.
91. Where will you look for the sporozoites of the malarial parasite?
 (a) Salivary glands of freshly moulted female *Anopheles* mosquito
 (b) Salivary glands of infected female *Anopheles* mosquito
 (c) Red blood corpuscles of humans suffering from malaria
 (d) Spleen of infected humans
92. Tobacco addiction causes-
 (a) gastric and duodenal ulcers (b) anthrax
 (c) skin eruptions (d) none of these
93. Fill in the blanks
 I. White blood cells called phagocytes move from place to place by _____ and kill microbes by first _____ them and then digesting them.
 II. Each antibody has _____ antigen-binding sites. It combines with _____ foreign microbes, causing them to _____.
 III. Antibodies produced by B cells are primarily active against _____ and _____.
 IV. Allergies are treated with drugs like _____ in case of normal allergic reactions and _____ in case of anaphylactic shock.
 V. Transplanted tissues and organs are rejected when the host's _____ attack antigens on the surface of the transplant. This set of antigens, unique to each genotype, is known as the _____ complex. V - T cells, cell surfaces, major histocompatibility. V - B cells, cell surfaces, major histocompatibility. V - T cells, cell surfaces, major histocompatibility.
 histocompatibility; V - antihistamines, epinephrine.

94. Which one of the following acts as a physiological barrier to the entry of microorganisms in human body?
 (a) Skin (b) Epithelium of Urogenital tract
 (c) Tears (d) Monocytes
95. Alcoholic beverages contain
 (a) methyl alcohol (b) ethyl alcohol (c) propyl alcohol (d) a mixture of all the above.
96. Tobacco is obtained from
 (a) *Diospyros melanoxylon* (b) *Nicotiana tabacum*
 (c) *Nicotiana rustica* (d) both (b) and (c)
97. Cancer cells are more easily damaged by radiation than normal cells because they are-
 (a) Starved to nutrition (b) Undergo rapid division (c) Different in structure (d) Non-dividing
98. Hybridomas are result of the fusion of
 (a) normal antibody producing cell with myeloma (b) abnormal antibody producing cell with myeloma
 (c) male reproductive cell with myeloma (d) female reproductive cell with myeloma
99. Withdrawal of tobacco produces
 (a) restlessness, depression and anxiety (b) increased appetite but disturbed bowels
 (c) insomnia and impaired concentration (d) all of the above.
100. Alteration of which genes lead to cancer ?
 (a) Cell proliferation gene (proto oncogenes) (b) Tumour suppressor gene
 (c) Mutant alder (d) Any of these
101. An example of innate immunity is
 (a) PMNL - neutrophils (b) T-lymphocytes (c) B-lymphocytes (d) T_H cells
102. A drunk person has earliest effect on which part of the brain?
 (a) cerebrum (b) cerebellum (c) pons (d) medulla oblongata
103. Which of the following diseases is due to an allergic reaction?
 (a) goitre (b) skin cancer (c) hay fever (d) enteric fever.
104. Alcohol is
 (a) hallucinogen (b) tranquilliser (c) stimulant (d) depressant
105. HeLa cells used in cell biology are-
 (a) Cancerous cell line in laboratory (b) Cervical cancer cell derivatives
 (c) Both of these (d) None of these
106. Out of the following diseases which are caused due to bacterial infection?
 A. Typhoid B. Elephantiasis C. Cholera D. Tuberculosis
 (a) A, B (b) B, C (c) A, C, D (d) A, B, C, D
107. Rickets occurs in the absence of -
 (a) protein (b) vitamin (c) minerals (d) hormone
108. Personal hygiene means
 A. to keep the body clean B. to keep the surroundings neat and clean
 C. regular exercise D. protein-rich diet
 (a) A, B (b) B, C (c) A, C, D (d) A, B, C, D

109. Hormone disease is -
 (a) colour blindness (b) allergy disease (c) cretinism (d) haemophilia
110. Drugs are obtained from -
 (a) mines (b) mango seeds (c) flowering plants (d) non-flowering plants
111. Bacteria causes -
 (a) tetanus (b) AIDS (c) Kala-azar (d) filaria
112. Cigarettes smoke contains -
 (a) carbon dioxide (b) carbon (c) hydrogen oxide (d) hydrogen monoxide
113. Pathogen of malaria is -
 (a) *Aedes* (b) *Plasmodium* (c) *Wuchereria* (d) *Anopheles*
114. Name the factors which do not allow them to enter the body -
 (a) physiological barrier (b) anatomical barrier (c) Inflammatory barrier (d) all these
115. Mental health requires -
 (a) rest and sleep (b) walking and running (c) addiction and sleep (d) none of these
116. Diagnosis of sexually-transmitted disease is done by -
 (a) DMA hybridisation (b) PCR (c) Elisa test (d) all these
117. What are needed for good health?
 (a) Balanced diet (b) Healthy air (c) Healthy dwelling house (d) All of these
118. A. Antigen is usually a foreign body which causes the formation of antibody.
 B. Antibody is a protein molecule.
 C. Antigen can be either protein or polysaccharide molecule.
 D. Antibody joins an antigen to destroy the latter.
 (a) Only A and B statements are correct. (b) Only A and C statements are correct,
 (c) All statements are incorrect. (d) All statements are correct.
119. Dengu fever is caused by -
 (a) bacteria (b) virus (c) protozoa (d) worms
120. From erythroxylon plant is obtained -
 (a) hashish (b) cocaine (c) opium (d) tobacco
121. Tobacco causes -
 (a) mouth cancer (b) hypertension (c) heart diseases (d) all of these
122. Psychotropic drugs are -
 (a) Psilocybin (b) LSD
 (c) Cocaine, Hashish, Charas, Marijuana (d) all of these
123. Elephantiasis is caused by -
 (a) bacteria (b) virus (c) fungi (d) worm
124. Wine causes-
 (a) increased blood pressure (b) cardiac diseases
 (c) liver damage (d) all of these
125. Protozoa causes -
 (a) malaria (b) Kala-azar (c) sleeping sickness (d) all of these
126. Antiserum is -
 (a) serum which contains lymphocytes (b) serum which contains red eeHs
 (c) serum containing thrombocytes (d) serum containing antibody
127. One of the following is caused by virus -
 (a) cholera (b) malaria (c) influenza (d) leprosy

128. What are the methods to avoid AI DS?
- (a) Keep away sex from many (b) Use condom during sexual intercourse
- (c) Use only disposable needle for injection (d) All of these
129. Agents spreading diseases are -
- (a) malaria (b) Kala-azar (c) filaria (d) all of these
130. Oncology is the study of -
- A. infectious diseases B. protozoan parasites C. tumour D. cancer
- (a) A, B (b) B, C (c) C, D
131. Metastasis is the process of-
- (a) Excessive cell proliferation
- (b) Transformation of benign tumour into a malignant tumour
- (c) Transformation of normal cell cancerous cells
- (d) Movement of cancerous cells from one organ to another
132. Current treatment for cancer does not include which of the following-
- (a) Chemotherapy (b) Radiation therapy (c) Surgery (d) Physiotherapy
133. Nervous system is influenced by -
- (a) heroine (b) cocaine (c) hashish (d) all of these
134. Benign tumour is are which-
- (a) Shows metastasis (b) Differentiated and capsulated
- (c) Differential and uncapsulated (d) Non-Differentiated and capsulated
135. Nutritive food elements are -
- (a) carbohydrates (b) proteins (c) fat (d) all of these
136. External factors responsible to produce disease is -
- (a) virus (b) bacteria (c) parasites (d) all of these
137. Degenerative diseases are -
- (a) arthritis (b) stroke of the brain (c) cardiac diseases (d) all of these
138. Hereditary disease is -
- (a) diabetes (b) Haemophilia (c) Cretinism (d) none of these
139. Smoke causes -
- (a) diseases of lungs (b) bronchitis (c) asthma (d) all of these
140. A frequent form of tumour which occurs due to AIPS is-
- (a) Achandropasia (b) Anorexia (c) Astigmatism (d) Kaposi sarcoma
141. Elephantiasis is caused by -
- (a) *Ascaris* (b) *Taenia* (c) *Wuchereria*
142. Types of cancer are -
- A. sarcoma B. leukaemia C. gastric ulcer D. lymphoma
- (a) A, B, D (b) B, C (c) A, C, D (d) A, B, C, D
143. Zidovudine is a drug used is-
- (a) Dengue fever (b) AIDS (c) Yellow fever (d) Leukemia
144. Pneumonia is caused by
- A. Trichophyton B. contact with infected person
- C. *Streptococcus pneumoniae* D. Epidermophyton
- (a) A, B (b) B, C (c) A, C, D (d) A, B, C, D

145. Interferon is protein that
 (a) Inactivates a virus
 (b) Protects unattacked cells from virus
 (c) Prevents viruses from taking over the cellular machinery
 (d) Both (b) & (c)
146. Which term would you use for combination of diseases such as Kaposi sarcoma, *Pneumocystis carinii*, J pneumonia, Leukoplakia etc?
 (a) Contagious diseases
 (b) Opportunistic diseases
 (c) Diarrhoea diseases
 (d) Autoimmune diseases
147. Urge of tobacco smoking can be easily given up by -
 A. motivation B. substitution with other activities
 C. regular exercise to reduce the stress D. nonvegetarian diet
 (a) A, B (b) A, B, C (c) A, C, D (d) A, B, C, D
148. If you are advised to get a Widal test done for yourself - which disease is your doctor suspecting?
 (a) Typhoid (b) Cholera (c) Pneumonia (d) Filariasis
149. Air-borne diseases are
 A. influenza B. typhoid C. tuberculosis D. diarrhoea
 (a) A, B (b) B, C (c) A, C, D (d) A, B, C, D
150. Which infectious disease can be treated effectively using oil of chenopodium?
 (a) Ascariasis (b) Filariasis (c) Malaria (d) Poliomyelitis
151. Diseases of human being caused by protozoan parasites are
 A. amebiasis B. malaria C. trypanosomiasis D. typhoid
 (a) A, B (b) A, B, C (c) A, C, D (d) A, B, C, D
152. A disease which often produces deformities of fingers and toes is
 (a) Poliomyelitis (b) Tuberculosis (c) Typhoid (d) Leprosy
153. Hodgkin's disease is -
 (a) Cancer of WBC'S (b) Cancer of liver
 (c) Cancer of lymphoid tissue (d) Cancer of mammary
154. Smoke of tobacco usually contains -
 A. alcohol B. nicotine C. phenol D. tar
 (a) A, B (b) A, B, C (c) B, C, D (d) A, B, C, D
155. AIDS-day is celebrated on -
 (a) 5th June (b) 1st Oct (c) 1st July (d) 1st Dec.
156. Immune responses are carried out by
 A. lymphocytes B. adipocytes C. immunoglobulins D. melanocytes
 (a) A, B (b) B, C (c) A, C (d) A, B, C, D
157. Ringworm is caused by fungus
 A. *Microsporium* B. *Trichophyton* C. *Rhizopus* D. *Oscillatoria*
 (a) A, B (b) B, C (c) A, C, D (d) A, B, C, D
158. A plant known as 'Sadabahar' is known to produce an anti-cancer drug known as
 (a) Taxol (b) Vincristine (c) Colchicine (d) Cyclosporine

159. Carcinoma is a cancer of-
- (a) Lymphocytes (b) Connective Tissue
(c) Erythrocytes (d) Ectoderm and endoderm
160. A cancerous condition known as Burkitts Lymphoma is known to be caused by virus like
- (a) Rous Sarcoma virus (b) Herpes simplex virus (c) Epstein Barr virus (d) Hepatitis B virus
161. Your patient shows paroxysms of Malaria after every 72 hours. Which-species of *Plasmodium* will be considered responsible to cause the infection?
- (a) *P. vivax* (b) *P. ovale* (c) *P. malariae* (d) *P. falciparum*
162. Which stage of *Plasmodium* parasite is infective for man?
- (a) Schizont (b) Gametocytes (c) Sporozoite (d) Merozoites
163. Carcinogen present in coal tar is
- (a) Nitroso dimethylene (b) 3,4-benzopyrine (c) 2-naphthylamine (d) 4-amino biphenyl
164. Which of the following is/are example of autoimmune disease?
- (a) Multiple sclerosis (b) Insulin dependent diabetes
(c) Rheumatoid arthritis (d) All of these
165. In leukaemia, there is tremendous increase in the numbers of
- (a) Red blood corpuscles (b) Immature cells
(c) White blood corpuscles (d) Both white blood cells and immature cells
166. Antigenic determinant sites bind to which portions of an antibody molecule?
- (a) Light chains (b) Heavy chains (c) Intermediate chains (d) Both (a) & (b)
167. Malarial parasite can be obtained from patient
- (a) During fever (b) Before temperature rise
(c) After temperature becomes normal (d) Elephantiasis
168. Which of the following immunity is conferred by transfer of immune products like antibodies from another individual into a non-immune individual?
- (a) Adaptive immunity (b) Specific immunity (c) Active immunity (d) Passive immunity
169. Marijuana is obtained from
- (a) Ergot (b) Cannabis (c) Papaver (d) Coffea
170. The opposite to innate immunity is
- (a) Passive immunity (b) T cells immunity (c) Phagocytosis (d) Acquired immunity
171. One of the following drugs depresses (switch off) the activities of CNS and is known as sedative. It gives feeling of calmness, relaxation or drowsiness
- (a) Opium (b) Heroin (c) Cocaine (d) Barbiturate
172. What is the role of complement in the body's defense?
- (a) It interferes with viral replication (b) It is involved with antibody production
(c) It aids antigen presentation (d) It causes cell lysis
173. Neoplasms are
- (a) Nuclei with massive DNA
(b) Cells without covering membranes
(c) Cells capable of unlimited division
(d) Newly produced cells formed through uncontrolled cell proliferation

174. Antibody is
 (a) A substance that specifically inactivates an antigen
 (b) Phagocyte that feeds on invading pathogen
 (c) Cellular component of blood
 (d) Secretion of RBC
175. Filariasis is caused by
 (a) *Wuchereria bancrofti* (b) *Glossing* (c) *Phlebotomus* (d) All of these
176. The cell which plays major role in host defense against tumor cells and the cells infected with viruses
 (a) B - lymphocytes (b) Interferon (c) NK cells (d) Neutrophils
177. *Entamoeba histolytica* causes
 (a) Chicken pox (b) Tetanus (c) Dysentery
178. Active immunity is due to
 (a) MARY cells (b) Killer T-cells (c) Helper cells (d) Suppressor T-cells
179. Antihistamine relieves
 (a) Nephritis (b) Allergy (c) Stroke (d) Angina pectoris
180. Immunity acquired after an infection is
 (a) Active immunity (b) Passive immunity (c) Innate immunity (d) Both (b) & (c)
181. Which of the following is obtained from Papaversomnffenim?
 (a) Opium (b) Heroin (c) Methadone (d) All of these
182. Natural killer (NK) cells can destroy
 (a) Invading micro-organisms (b) Virus infected cells
 (c) Some tumor cells (d) All of these
183. Sleeping pills contain
 (a) Benzodiazepines (b) Psilocybin (c) Tranquillisers (d) LSD
184. Active immunity is obtained by
 (a) Natural resistance (b) Antibiotics
 (c) Weakened germs infection (d) None of these
185. A
 (a) (b) (c) (d)
186. Which of the following is not true for interferon?
 (a) These act outside the cells (b) These are quick acting
 (c) Their action is long lasting (d) These act against viruses
187. An autoimmune disease is
 (a) Haemophilia (b) AIDS (c) Allergy (d) Myasthenia gravis
188. Fill up the blanks -
 A. Cancer diagnosis can be done by _____, _____ and _____ which generate image of the internal organs.
 B. The primary lymphoid organs are _____ and _____ where immature _____ differentiate into antigen-sensitive one.
 C. Allergy is due to the release of chemicals like histamine and _____ from the _____ cells.
 D. RNA genome of HIV replicates to form viral DNA with the help of enzyme _____.
 E. In food-borne diseases such as and ascariasis, preventive measures should be taken in proper cleaning of food items, disinfection of water reservoirs etc.

- (a) A- bone marrow, thymus, lymphocytes; B - radiography, CT Scan, MRI; C - serotonin, mast; D - typhoid, amoebiasis; E - reverse transcriptase
 (b) A- radiography, CT Scan, MRI; B - bone marrow, thymus, lymphocytes; C - serotonin, mast; D - reverse transcriptase; E - typhoid, amoebiasis
 (c) A - radiography, CT Scan, MRI; B - bone marrow, thymus, lymphocytes; C - serotonin, mast; D - typhoid, amoebiasis; E - reverse transcriptase
 (d) A- bone marrow, thymus, lymphocytes; B - radiography, CT Scan, MRI; C - serotonin, mast; D - reverse transcriptase; E - typhoid, amoebiasis

189: Which of the following is/are the ill-effect(s) of smoking?

- (a) psychological stress (b) reduces immunity (c) coronary diseases (d) Both b and c

190. Fill up the blanks -

- A. In malaria, the rupture of _____ release a toxic substance called _____ which is responsible for the chill and recurring fever.
 B. _____ results in blockage of the intestinal passage. A healthy person acquires this through contaminated water, vegetables, fruits etc.
 C. T-lymphocytes mediate _____ immunity and B-lymphocytes mediate _____ immunity.
 D. Genes in normal cells which when activated under certain conditions can cause cancerous transformation, are called _____.
 E Smoking increases _____ content in blood and reduces the concentration of haemoglobin oxygen. This causes oxygen deficiency in the body.

- (a) A- RBCs, haemozoin; B - ascariasis; C - cell-mediated, humoral; D - proto oncogenes; E - carbon monoxide
 (b) A- cell-mediated, humoral; B - ascariasis; C - RBCs, haemozoin; D - proto oncogenes; E - carbon monoxide
 (c) A- RBCs, haemozoin; B - proto oncogenes; C - cell-mediated, humoral; D - ascariasis; E - carbon monoxide
 (d) A- RBCs, haemozoin; B - ascariasis; C - cell-mediated, humoral; D - proto oncogenes; E - carbon dioxide

191. Which of the following diseases cause chronic inflammation in the lymphatic vessels of the lower limb that results into its massive swelling?

- (a) ascariasis (b) filariasis (c) amoebiasis (d) trypanosomiasis

192. Normal cells are called cancerous when they show the following property

- (a) new blood vessels formation (angiogenesis) (b) uncontrolled cell division
 (c) both a and b (d) contact inhibition

193. Match the Column I with Column II -

Column I

- A. Peyer's patches
 B. Rheumatoid arthritis
 C. IgA
 D. Interferon
 E. Gambusia
 F. Chikungunya
 G. Tetanus
 H. IgE
 I. Malignant tumor
 J. Carcinogen

Column II

- (i) Aedes
 (ii) Neoplastic transformation
 (iii) Cancer treatment
 (iv) Allergy
 (v) Secondary lymphoid organ
 (vi) Metastasis
 (vii) Colostrum
 (viii) Autoimmunity
 (ix) Antitoxin
 (x) Mosquito larvae

- (a) A- (v), B - (viii), C - (vii), D - (iii), E - (x), F - (i), G - (ix), H - (iv), I - (vi), J - (ii)
 (b) A- (vi), B - (viii), C - (vii), D - (iii), E - (x), F - (ii), G - (ix), H - (iv), I - (v), J - (iii)
 (c) A - (iv), B - (viii), C - (vii), D - (iii), E - (x), F - (i), G - (ix), H - (v), I - (vi), J - (ii)
 (d) A- (x), B - (viii), C - (vii), D - (iii), E - (v), F - (i), G - (ix), H - (iv), I - (vi), J - (ii)

194. Which of the following is/are example(s) of the passive immunity?
 (a) inoculated antigen administration (b) polio vaccine drops
 (c) antitoxin serum (d) colostrum
195. AIDS can be diagnosed by
 (a) radio immunoassay (RIA) (b) enzyme linked immuno-sorbent assay (ELISA)
 (c) western blotting (Confirm test) (d) All of the above
196. Opioid are popularly called
 (a) sedative (b) anti depressant (c) stimulant (d) pain killers
197. Autoimmunity is caused due to the
 A. ability of immune cells to discriminate between self cells from non-self cells.
 B. inability of immune cells in damaging self cells representing foreign antigens.
 C. inability of immune cells in distinguishing self cells from non-cells
 D. ability of immune cells to damage self cells.
 ' (a) C and D are correct (b) A, B and C are correct (c) All are correct (d) None
198. Innate immunity is non-specific defence present from the time of birth. It consists of
 (a) skin, mucus coating of the epithelium
 (b) neutrophils, monocytes, macrophages, natural killer cells.
 (c) interferons, cytokines
 (d) All of the above
199. Which of the following options correctly represent the life cycle of Plasmodium?
 A. sporozoites (human) → RBCs → liver cells gametocytes (RBCs) → blood meal (female mosquito) → multiply (mosquito) → sporozoites (mosquito)
 B. sporozoites (mosquito) → bite → RBCs (human) → liver cells gametocytes (RBCs) → sporozoites (human) → blood meal (female mosquito).
 C. sporozoites (human) → liver cells → RBCs. gametocytes (RBCs) → blood meal (female mosquito) → multiply (mosquito) → sporozoites (mosquito).
 D. blood meal (female mosquito) → multiply (mosquito) → sporozoites (mosquito) → bite → liver cells (human) → RBCs → gametocytes (RBCs)
 (a) A and B are correct (b) C and D are correct (c) All are correct (d) None
200. Match the following -
- | Column A | Column B |
|-------------------------|-------------------------------|
| I. Allergy | (i) Typhoid fever |
| II. T-helper cells | (ii) Single stranded RNA |
| III. Hallucinogens | (iii) <i>Wuchereria</i> |
| IV. Liver | (iv) IgE |
| V. Widal test | (v) Cirrhosis |
| VI. Filariasis | (vi) <i>Atropa belladonna</i> |
| VII. ELISA test | (vii) Activation of B-cells |
| VIII. AIDS virus | (viii) Carcinogens |
| I.. Treatment of cancer | (ix) AIDS |
| ., X-rays | (x) Immunotherapy |

- (a) I - (iv), II - (vi), III - (viii), IV - (v), V - (i), VI - (iii), VII - (ix), VIII - (ii), IX - (x), X - (vii)
 (b) I - (iv), II - (vii), III - (vi), IV - (v), V - (i), VI - (iii), VII - (ix), VIII - (ii), IX - (x), X - (viii)
 (c) I - (iv), II - (vii), III - (v), IV - (ii), V - (i), VI - (iii), VII - (ix), VIII - (vi), IX - (x), X - (viii)
 (d) I - (iv), II - (vii), III - (vi), IV - (v), V - (i), VI - (ix), VII - (x), VIII - (ii), IX - (iii), X - (viii)

201. Identify the false statements -

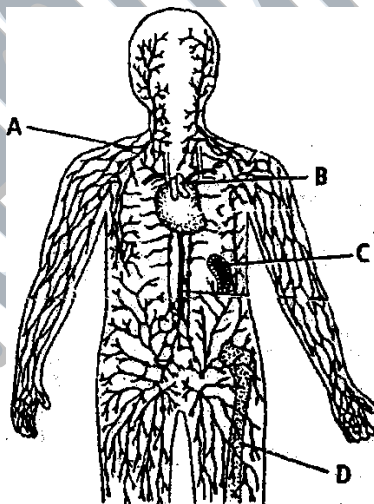
- I. Antigen-binding site of an antibody is found between two light peptide chains.
 II. The pathogen of elephantiasis is transmitted to a healthy person through the bite of same mosquito species which also cause malarial disease.
 III. Lymphoid tissues are also located within the lining of the major tracts called mucosal-associated lymphoid tissue.
 IV. Increase intake of coffee or tea can cause indigestion, insomnia and disturb renal functions.
 V. Anaphylactic shock is an autoimmune reaction which involves all the tissues of the body that results in drastic fall in blood pressure.

- (a) III, V (b) II, IV (c) I, II, V (d) I, II, IV

202. AIDS spread due to

- (a) homosexuality (b) immoral way of life (c) both a and b (d) safe sex.

203. Given figure refers the human lymphatic system.



- (a) A - lymph nodes (Primary Lymphoid organ), B - thymus (Pri. Lymphoid organ), C - spleen (Secondary lymphoid organ), D - bone marrow (Sec. lymphoid organ)
 (b) A - lymph nodes (Primary Lymphoid organ), B - thymus (Secondary Lymphoid organ), C - spleen (Pri. lymphoid organ), D - bone marrow (Pri. lymphoid organ)
 (c) A - lymph nodes (Secondary Lymphoid organ), B - thymus (Primary Lymphoid organ), C - spleen (Sec. lymphoid organ), D - bone marrow (Pri. lymphoid organ)
 (d) A - lymph nodes (Primary Lymphoid organ), B - thymus (Secondary Lymphoid organ), C - spleen (Sec. lymphoid organ), D - bone marrow (Sec. lymphoid organ)

204. HIV attacks

- (a) B-lymphocytes (b) T-lymphocytes (c) antibodies (d) erythrocytes.

205. Refer the given flow chart of the mode of action of AIDS virus and answer the following questions.

Identify the labelled sequences A, B, C and D.

(a) A - Viral DMA introduced into cell; B - Viral DMA;

C -Viral DMA incorporates into host RNA; D - New viral RNA produced

(b) A - Viral RNA introduced into cell; B - Viral RNA;

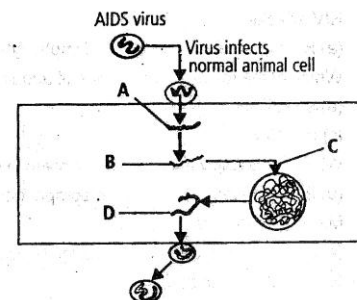
C -Viral DMA incorporates into host DNA; D - New viral DNA produced

(c) A - Viral RNA introduced into cell; B - Viral DNA;

C -Viral DNA incorporates into host DNA; D - New viral RNA produced

(d) A- Viral DNA introduced into cell; B - Viral RNA;

C - Viral RNA incorporates into host DNA; D - New viral DNA produced



206. Genes involved in cancer are

(a) regulator gene

(b) tumour gene

(c) oncogenes

(d) suppressor genes

207. Which of the following is correctly matched and is a sexually transmitted disease-

(a) AIDS –bacterium

(b) Syphilis-Treponema pallidum

(c) Gonorrhoea-Mycobacterium

(d) All of these

208. Which of the following measures is not useful for prevention and control of alcohol and drugs among adolescents?

(a) education & counselling

(b) medical help

(c) peer pressure

(d) looking for danger sign

209. Pneumonia is caused by

(a) *Streptococcus pneumoniae*

(b) *Salmonella typhi*

(c) *Haemophilus influenzae*

(d) both a and c

210. Which of the following cells are involved in immune mechanism of the body?

(a) lymphocytes

(b) macrophages

(c) neutrophils

(d) All

211. Metastasis occurs in case of

(a) grown gall tumour

(b) benign tumour

(c) malignant tumour

(d) none of these

212. Which one of the following is a matching pair of a drug and its category?

(a) amphetamines — stimulant

(b) lysergic acid diethyl amides (LSD) — narcotic

(c) heroin — psychotropic

(d) benzodiazepines — pain killer

213. Amoebiasis (Amoebic dysentery) is caused by

(a) *Wuchereria*

(b) *Ascaris*

(c) *Entamoeba*

(d) *Plasmodium*

214. Nicotine, an I stimulates II gland to release adrenaline and nor-adrenaline into blood circulation, both of which III blood pressure and increase heart rate. Smoking is associated with increased incidence of cancers of lung, urinary bladder and throat, bronchitis, emphysema, coronary heart disease, gastric ulcer, etc. Tobacco chewing is associated with increased risk of cancer of the oral cavity. Smoking increases IV content in blood and reduces the concentration of haemoglobin V

(a) I-Alkaloid, II-Adrenal, III-Raise, IV-CO, V-O₂

(b) I-Acid, II-Adrenal, III-Raise, IV-CO, V-O₂

(c) I -Alkaloid, II - Thyroid, III - Raise, IV- CO₂, V- CO

(d) I -Alkaloid, II -Adrenal, III - Decrease, IV- CO, V- O₂

215. Which is a cancer-causing virus-

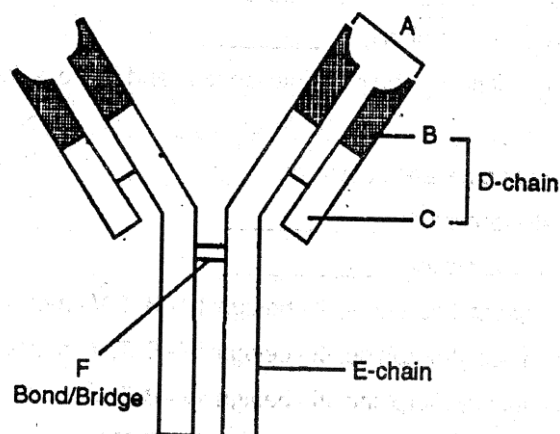
(a) Myxovirus

(b) Rubella virus

(c) SV-40

(d) All of these

216. Women who consumed the drug thalidomide for relief from vomiting during early months of pregnancy gave birth to children with-
- (a) No splcer (b) Harelip (c) Extra fingers and toes (d) Under developed limbs
217. A person showing unpredictable moods, outbursts of emotions, quanselsome behaviour and conflicts with others is suffering from-
- (a) Schizophrenia (b) Borderline personality disorder (BPD)
(c) Mood disorders (d) Addictive disorders
218. Identify the true statements-
- I. ' Abstinence from drugs of dependence causes withdrawal symptoms but not craving. "
II. Chikungunya is confirmed by Widal test.
III. Rheumatoid arthritis which affects many people in our society is an auto-immune disease.
IV. AIDS was first reported in 1981 and is caused by a member of a group of viruses called retroviruses.
V. Benign tumors are normally considered with metastasis.
VI. Most powerful stimulant is cocaine.
- (a) I,II,V (b) I, III, IV, VI (c) III,V,VI (d) III,IV,V
219. Select the false statements -
- I. An antibody is a protein molecule made by the lymphocytes.
II. An antibody binds to a specific foreign antigen and neutr zes its odd effects,
III. A type of acquired immune response is called cell-mediated immunity. This type of immunity is mediated by T-lymphocytes.
IV. Cancer is contagious and cells can spread from one person to another.
V. Cancerous cells fire highly differentiated cells.
VI. Cancer detection is based on biopsy and histopathological studies of the tissue and blood.
VII. Techniques like radiography, CT and MRI are very useful to detect cancers of the internal organs.
VIII. Diseases which are easily transmitted from one person to another, are called infectious diseases.
IX AIDS is non-infectious and cancer is infectious disease,
X Salmonella typhi is a pathogenic bacterium which causes typhoid fever in human beings.
XI. Sustained high fever (39° to 40°C), weakness, stomach pain, constipation, headache and loss of appetite are some of the common symptoms of typhoid.
XII. Nicotine stimulates thyroid Gland.
XIII. Smoking increases CO₂ content in blood.
XIV. AIDS has no cure, prevention is the best option.
XV. HIV/AIDS infected people should be shunned by society.
- (a) I, IV (b) IV, V, IX,XII, XIII,XV (c) All (d) Nbne
220. The diagram shows an antibody molecule. Identify A to F.



- (a) A - Antigen binding site; B - Variable region (of L-Chain); C - Constant region (of L-Chain); D - Light polypeptide chain (L-Chain); E - Heavy polypeptide chain (H-Chain); F - Disulfide (bond)
- (b) A-Antigen binding site; B - Constant region (of L-Chain); C - Variable region (of L-Chain); D - Light polypeptide chain (L-Chain); E - Heavy polypeptide chain (H-Chain); F - Disulfide (bond)
- (c) A-Antigen binding site; B-Variable region (of L-Chain); C - Constant region (of L-Chain); D - Heavy polypeptide chain (L-Chain); E - Light polypeptide chain (H-Chain); F - Hydrogen (bond)
- (d) A-Antigen binding site; B - Variable region (of L-Chain); C-Constant region (of L-Chain); D - Light polypeptide chain (L-Chain); E - Heavy polypeptide chain (H-Chain); F - Hydrogen (bond)

221. Fill up the blanks-

- I. The primary lymphoid organs are _____ and _____.
- II. Heroin commonly called "smack" is chemically _____.
- III. _____ tumors remain confined to their original location and do not spread to other parts of the body.
- IV. The immune system comprises _____ cells and _____ cells. V _____ is very effective sedative and pain killer.
- VI. A group of symptoms is literally termed as _____.
- VII. The fungi Trichophyton is responsible for _____.
- (a) I - bone marrow & thymus; II - diacetylmorphine; III - benign; IV - B, T; V - morphine; VI - syndrome; VII - ringworms
- (b) I - bone marrow & thymus; II - diacetylmorphine; III - benign; IV - B, T; V - morphine; VI - ringworms; VII - syndrome
- (c) I - bone marrow & thymus; II - diacetylmorphine; III - benign; IV - B, T; V - syndrome; VI - morphine; VII - ringworms
- (d) I - bone marrow & thymus; II - diacetylmorphine; III - benign; IV - B, T; V - ringworms; VI - syndrome; VII - morphine

222.

Properties	Normal Cells	Cancerous cells
Tumor formation	A	B
Contact inhibition	C	D
Metastasis	E	F

- (a) A-Yes, B - No, C - No, D-Yes, E - No. F-Yes
- (b) A-No, B-Yes, C-Yes, D - No, E-No, F-Yes
- (c) A-No, B-Yes, C-No, D-Yes, E - No, F-Yes
- (d) A-Yes, B- No, C-Yes, D - No, E-Yes, F - No

223. Which one of the following techniques is safest for the detection of cancers

- (a) Magnetic resonance imaging (MRI) (b) Radiography (X-ray)
- (c) Computed tomography (CT) (d) Histopathological studies

224. Slow respiration, slow pulse and constriction of pupil occurs due to addiction of-

- (a) Morphine and opium (b) Cocaine and Heroin
- (c) Alcohol and Thalidomide (d) Nicotine and caffeine

225. Given below are 4-statements. Read the statements and mark the option that has both correct statements
 (!) Heroin, commonly called Smack, is obtained by acetylation of morphine
 (II) Cocaine is obtained from the latex of *Papaversomniferum*
 (III) Marijuna interferes with the transmission of dopamine
 (IV) Morphine is an effective sedative and plain killed
 (a) A and B (b) A and D (c) B and C (d) C and D
226. Following vaccine has been produced from yeast by recombinant DNA technology
 (a) Hepatitis A (b) Hepatitis B (c) Hib (d) Oral Polio
227. Mark the incorrect statement
 (a) The property of metastasis is shown by malignant tumours
 (b) Carcinogens are chemical agents for causing cancer
 (c) Cellular oncogenes (C-ONC) are found in normal cells
 (d) None of these
228. When a quick immune response is required due to infection of a deadly microbe, the patient is injected with
 (a) Protein of pathogen (b) Inactivated or weakened pathogen
 (c) Preformed antibodies (d) Vaccine
229. The antibodies produced during allergy are
 (a) Ig G type (b) Ig M type (c) Ig A type (d) Ig E type
230. The toxic substance, 'Haemozoin', related to the high fever and chill, is released during following disease
 (a) Dengue (b) Malaria (c) Diphtheria (d) Pneumonia
231. The name of 'Mary Mallon' is associated with the disease ;
 (a) Typhoid (b) Leprosy (c) Tuberculosis (d) Small pox
232. A person suffering from a disease caused by *Plasmodium* experiences recurring chill and fever at the time when?
 (a) the sporozoites released from RBCs are being rapidly killed and broken down inside spleen
 (b) The trophozoites reach maximum growth and give out certain toxins
 (c) The parasite after its rapid multiplication inside RBCs ruptures them, releasing the stage to enter fresh RBCs.
 (d) The microgametocytes and megagametocytes are being destroyed by the WBCs
233. The foetus gets immunized after receiving antibodies from mother through placenta. This type of immunization is called ...
 (a) Active immunity (b) Innate immunity (c) Passive immunity (d) Humoral immunity
234. Bacteria like *Streptococcus* and *Haemophilus influenzae* are responsible for
 (a) Diphtheria (b) Dysentery (c) Plague (d) Pneumonia
235. The exaggerated response of the immune system to certain antigens is called
 (a) Primary response (b) Secondary response
 (c) Immune suppression response (d) Allergy
236. Both, Hepatitis B and AIDS are
 (a) Cause by Retro-viruses (b) Transmitted through sexual contact
 (c) Congenital diseases (d) Transmitted through infected blood
237. The following lymphoid organ provides the site for the interaction of lymphocytes with the antigen ^-
 (a) Bone marrow (b) Thymus (c) Spleen (d) All of these
238. The pathogens of genera, *Microsporum*, *Trichophyton* and *Epidermophyton* are responsible for
 (a) Botulism (b) Conjunctivitis (c) Ring worms (d) Skin allergy
239. Which of the following disease is caused by the member of Retro-virus group ?
 (a) Cancer (b) AIDS (c) Dengue (d) Common cold
240. The use of antihistamine, adrenaline and steroids quickly reduce the symptoms of
 (a) Fungal disease (b) Viral disease (c) Allergy (d) helminthes disease
241. Which of the following non-infectious disease is a major cause of death in human beings?
 (a) AIDS (b) Cirrhosis (c) Cancer (d) Asthma
242. malignant malaria is caused by the following species of *Plasmodium*
 (a) vivax (b) malaria (c) ovale (d) falciparum
243. The cell-mediated immunity inside the human body is carried out by-
 (a) B-lymphocytes (b) Thrombocytes (c) Erythrocytes (d) T-lymphocytes
244. Which of the following is correctly matched.
 (a) Thyroxine - Tetanus (b) Insulin - Diabetes (c) Adrenaline - Hepatitis (d) Parathyroid - Tetany
 (d) Rejection of a kidney graft is the function of B-lymphocytes

245. Xenograft means
 (a) a graft between two genetically identical individuals
 (b) a graft in which a tissue is grafted from one individual to another individual of the same species
 (c) a graft between individuals of different species
 (d) tissue grafted from one area to another of the same individual. Hepatitis B virus is a
 (a) hepadnavirus (b) variolavirus (c) retrovirus (d) picornavirus.
246. Which one of the following is not a property of cancerous cells whereas the remaining three are ?
 (a) They compete with normal cells for vital nutrients.
 (b) They do not remain confined in the area of formation.
 (c) They divide in an uncontrolled manner
 (d) They show contact inhibition.
247. Aedes acgypti in the vector for-
 (a) Dengue fever (b) Yellow fever (c) Both a and b (d) Japanese encephalitis
248. Motile zygote of Plasmodium occurs in :
 (a) Gut of female Anopheles (b) Salivary glands of Anopheles
 (c) Human RBCs (d) Human liver
249. Infection of Ascaris usually occurs by
 (a) Eating imperfectly cooked meat (b) Tse-tse fly
 (c) Mosquito bite (d) Drinking water containing eggs of Ascaris
250. Inadequate protein intake leads to kwashiorkor. The subsequent oedema is mostly closely related to inadequate synthesis of which protein-
 (a) Gamma globulins (b) Glucocorticoids (c) Insulin (d) Albumin
251. Which one among the following forms the chemical barrier for infections?
 (a) Isozyme (b) Lysozyme (c) Coughing (d) Lysosome
252. In which one of the following options the two examples are correctly matched with their particular type of immunity
- | Examples | Type of immunity |
|--|------------------------|
| (a) Polymorphonuclear leukocytes and monocyte | Cellular barriers |
| (b) Anti-tetanus and anti-snake bite injection | Active immunity |
| (c) Saliva in mouth and Tears in eyes | Physical barriers |
| (d) Mucus coating of epithelium lining the urinogenital tract and the HCl in stomach | Physiological barriers |
253. Cirrhosis of liver is caused by the chronic intake of
 (a) Opium (b) Alcohol (c) Tobacco (Chewing) (d) Cocaine
254. Common cold differs from pneumonia in, that:
 (a) Pneumonia is a communicable disease whereas the common cold is a nutritional deficiency disease.
 (b) Pneumonia can be prevented by a live attenuated bacterial vaccine whereas the common cold has no effective vaccine.
 (c) Pneumonia is caused by a virus while the common cold is caused by the bacterium Haemophilus influenzae.
 (d) Pneumonia pathogen infects alveoli whereas the common cold affects nose and respiratory passage but not the lungs
255. Alcohol affects mental and motor functions because-
 (a) It is quickly absorbed in gut
 (b) It causes degeneration of contractile fibers of muscles
 (c) It crosses blood brain barrier
 (d) It raises blood pressure
257. Which one of the following is not a property of cancerous cells whereas the remaining three are ?
 (a) They compete with normal cells for vital nutrients
 (b) They do not remain confined in the area of formation
 (c) They divide in an uncontrolled manner
 (d) They show contact inhibition
258. Which of the following is correctly matched regarding institute and its location.
 (a) National Institute of virology-pune (b) National Institute of communicable disease
 (c) Central Drug research institute-kasuti (d) National Institute of Nutrition-Mumbai
259. In certain parts of central India, muscular dystrophy is commonly found amongst the poor people because they eat cheap pulse from the plant-
 (a) Pisum sativum (b) Lathyrus sativus (c) Cicer arietinum (d) Phaseolus mungo
260. Kala azar is transmitted by-
 (a) Sandfly (b) Tsetse fly (c) Housefly (d) Mosquitoes

261. Diphtheria is caused by-
- (a) Poisons released by living bacterial cells into the lost tissue
 - (b) Poisons released from dead bacterial cells into the lost tissue
 - (c) Poisons released from virus into the host tissue
 - (d) Emissive immune response by the host's body

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	a	c	b	b	b	b	a	b	d	d	b	a	a	c	b	d	d	b	b	a
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	a	a	b	d	b	b	d	c	c	d	d	a	c	c	d	a	a	c	c	b
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	a	a	d	a	d	d	b	c	b	d	d	a	d	c	a	c	d	d	c	b
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	d	d	b	c	d	c	c	d	b	c	c	a	b	c	c	d	a	b	b	b
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	a	b	c	b	d	d	d	b	b	c	b	a	a	c	b	d	b	a	d	d
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	a	a	c	d	a	c	b	a	c	c	a	b	b	d	a	d	d	d	b	b
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	d	d	d	d	d	d	c	d	d	c	d	d	d	d	d	d	d	b	d	d
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	c	a	b	b	d	b	b	a	a	a	b	a	c	c	d	c	a	c	d	d
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	d	d	b	a	d	d	a	d	b	d	d	d	d	a	a	c	c	a	b	a
Ques.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
Ans.	d	d	a	c	d	c	d	b	d	a	b	c	a	a	d	d	a	d	b	b
Ques.	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
Ans.	c	c	c	b	c	c	b	c	d	d	c	a	c	a	c	d	d	b	b	b
Ques.	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
Ans.	a	b	a	a	b	b	b	c	d	b	a	c	c	d	d	d	c	c	b	c
Ques.	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
Ans.	c	d	d	d	c	d	c	a	d	a	b	a	b	a	c	b	d	a	b	a
Ques.	261																			
Ans.	a																			

STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION

1. Green revolution in India was possible due to
 (a) better irrigation, fertilizers and pesticide facilities (b) exploitation of high yielding varieties
 (c) intensive cultivation (d) All of the above
2. Which of the following diseases is/are poultry disease?
 A. aspergillosis B. ranikhet disease C. gill rot D. black rot.
 (a) Both A and B (b) Both C and D (c) Only C (d) Only D
3. What was the colour of high yielding Mexican wheat?
 (a) White (b) Pink (c) Red (d) Grey
4. Which one of the following is the common hexaploid bread wheat?
 (a) *Triticum aestivum* (b) *Triticum durum* (c) *Triticum monococcum* (d) *Triticum turgidum*
5. Autopolyploidy can be induced artificially by
 (a) Chloroform (b) Colchicine (c) Chloroquine (d) Colchine
7. One of the following is an improved variety of chicken -
 (a) Jersey (b) Leg horn (c) Himigiri (d) Kalyan Sona
8. Tissue culture technique can produce indefinite number of new plants from a small parental tissue. The economic importance of the technique is in raising
 (a) variants through picking up somaclonal variation (b) genetically uniform population of an elite species
 (c) homozygous diploid plants (d) development of new species.
9. Triticale is the first man made cereal crop. The combination of parents involve its production is *Triticum* and
 (a) Sorghum (b) Barley (c) *Saccharum* (d) Rye
10. Improved varieties of wheat suitable for Indian climate have been developed by
 (a) hybridization and mutation (b) mutation and cloning
 (c) cloning and polyploidy (d) polyploidy and hybridisation.
11. Haploids are considered better genetic stock because they
 (a) Need only half of the total nutrients (b) Are best for cytological studies
 (c) Grow better under all conditions (d) Form homozygous individuals on diploidization
12. Which one of the following characters was most important for selection of present day maize plants ?
 (a) Herbaceous habit (b) Unisexual flowers
 (c) Cobs covered tightly by spathes (d) Annual life span
13. What is the common name of *Triticum monococcum*?
 (a) Emmer Wheat (b) Wild Einkorn (c) Domesticated Einkorn (d) Common bread wheat
14. In hybridization the haploids combine the advantages of
 (a) recombination (b) segregation (c) fixation (d) All of the above
15. Amino acids present in improved varieties of maize are
 (a) methionine and alanine (b) alanine and cysteine (c) methionine and cysteine (d) lysine and tryptophan.

16. Which of the following procedures is/are followed in dairy farm management?
- A. regular inspections and visits by veterinary doctors
 B. usage of manure to increase crop yields
 C. adequate environmental condition is provided
 D. weeding away unproductive and harmful plants from the brood house.
- (a) A and Bare correct (b) A and Care correct (c) C and D are correct (d) All are'correct
17. The colour of high yielding Mexican wheats were not liked by the Indians. It was originally red grained. Their cultivation was adopted in India on large scale only when exposure to gamma radiations converted them to amber grained. Which of following methods of plant-breeding has been put into practise in the given case?
- (a) polyploid breeding (b) interspecific hybridisation (c) genetic engineering (d) mutation breeding.
18. Which of the following points should be kept into consideration for successful bee keeping?
- A. selection of suitable location for keeping the beehives
 B. light management according to the habits of honey bees
 C. knowledge of the behaviour of honey bees
 D. handling and collection of honey and bee wax.
- (a) A, B, C (b). A, C, D (c) A, B, C, D (d) None
19. Which of the following methods is/are used in recovery of healthy plants from diseased plants?
- (a) embryo culture (b) meristem culture (c) suspension culture (d) anther culture.
20. A breed of cow is mated with closely related breed for five generations. It was found that production of milk has reduced subsequently and the animals are not keeping good health. Which of following methods of animal breeding can overcome this problem?
- (a) hybridisation (b) controlled breeding (c) outcrossing (d) cross breeding
21. In shoot and root culture, excess of auxin in the medium will promote
- (a) shoot culture (b) root culture
 (c) both shoot and root culture (d) none of these.
22. The plant part which is used to culture is called
- (a) Explant (b) Endplant (c) Transplant (d) Callus
23. The process of cultivating and bringing about certain changes in the wild forms so that they yield better under artificial growing conditions is called
- (a) domestication (b) breeding (c) conservation (d) selection.
24. The application of induced mutations for crop improvement is called
- (a) Mutation breeding (b) Apomixis (c) Adventive embryony (d) Cloning
25. What was the source of first induced mutations?
- (a) Gamma ray (b) UV-irradiation (c) X-ray (d) Cosmic rays
26. The most common sources of single cell protein are
- (a) yeasts (b) bacteria (c) other fungi (d) All of these
27. Pollen grains of a plant whose $2n = 28$ are cultured to get callus by tissue culture method. What would be the number of chromosomes in the cells of the callus?
- (a) 14 (b) 56 (c) 28 (d) 21
28. One of the following species of wheat was most primitive and wild

- (a) *Triticum monococcum* (b) *Triticum durum* (c) *Triticum turgid urn* (d) *Triticum boeoticum*
29. Mule is produced by a cross between
(a) a mare and a donkey (b) a female donkey and a male horse
(c) a male and a female donkey (d) a male and a female horse.
30. Germ plasm also preserve rare genotype for
(a) Cultivation on large scale (b) Tracing the history of evolution
(c) Breeding and improvement (d) Chromosome study and phytoeny of cytotypes
31. Improved rice variety IR-8 has been introduced in India from
(a) Taiwan (b) Japan (c) Philippines (d) Bangladesh.
32. Disease free plants are obtained from
(a) Anther culture (b) Ovary culture (c) Shoot-apex culture (d) Root-apex culture
33. Which of the following is/are the advantage(s) of micropropagation?
(a) it helps in rapid multiplication of plants
(b) it helps in production of somaclones
(c) it is an easy, safe and economical method for plant propagation.
(d) All of the above
34. Culture of isolated microspores results in the formation of
(a) Microgametophyte (b) Male gametes
(c) Haploid embryoids (d) Heterozygous embryoids
35. Which of the following methods of breeding increases the chance of homozygosity?
(a) in breeding (b) out breeding (c) out crossing - (d) cross breeding.
36. Which one of the following is called macaroni wheat which is mainly used for preparing pasta and noodles?
(a) *Triticum turgidum* (b) *Triticum durum* (c) *Triticum speltoides* (d) *Triticum tauschii*
37. Multiple ovulation embryo transfer technology (MOET) induces which of the following in cow?
(a) super ovulation (b) follicular maturation in ovary (c) ovulation (d) Both a and b
38. Which of the following is the conventional method of plant breeding for disease resistance?
(a) polyploidy (b) genetic engineering (c) hybridisation (d) mutation breeding.
39. The set pollinated progeny of a homozygous plant constitute a
(a) Pure line (b) Mixed population (c) Mass selection (d) Heterosis
40. Crosses between two plants by the same variety are called
(a) Interspecific (b) Intervarietai (c) intravarietai (d) Intergeneric
41. Pomato
(a) is produce by hybridization between pome and tomato
(b) is the product of cross fertilization
(c) has all the desired combination of characteristics for its commercial utilization
(d) does not have all the desired combination of characteristics for its commercial utilization
42. In high yielding hybrid crop varieties, to exploit hybrid vigour, the farmers need to purchase fresh hybrid seed every year because
(a) they are not allowed to grow their own seeds
(b) the hybrid vigour is lost due to inbreeding depression

(c) the Government of India has accepted Dunkel's proposal

(d) it is cheaper to purchase fresh seed

43.

Fig. A

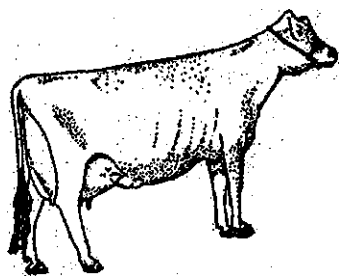
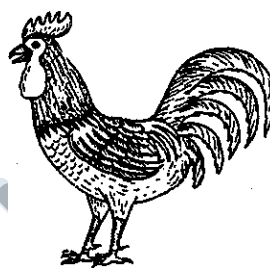


Fig. B



Identify improved breed shown in diagram -

(a) A - Jersey, B - Leghorn

(b) A - Surti, B - Sangammeri

(c) A - Marwari, B - Sirohi

(d) Beetal, B - Jamunapari

44. Choose the correct answer -

(a) Terminator genes helps in terminating seed germination

(b) Axenic culture is pure culture without any contamination

(c) Androgenic haploidy makes use of anther cells

(d) All of the above

45. Protection of genetic resources is called

(a) Genetic drift

(b) Gene pool

(c) Genetic conservation

(d) Gene flow

46. Aims of plant breeding are to produce ,

(a) Disease-free varieties (b) High-yielding varieties

(c) Early maturing varieties (d) All the above

47. The loss of genes from a gene pool is called

(a) Gene knockout

(b) Gene flow

(c) Gene shift

(d) Genetic erosion

48. The indica variety-of rice is crossed with japonica variety of rice because the later are

(a) high yielding

(b) resistant to diseases

(c) cheaper

(d) short-life cycled annual

49. Wild varieties of plants must be conserved to -

(a) Maintain ecosystem

(b) Feeding wild animals

(c) Future evolution

(d) Incorporate useful traits in future crop varieties

50. In which crops is the method of mass selection applied.

(a) Cross-pollinated

(b) Self-pollinated

(c) Both self and cross-pollinated

(d) Potato and sugarcane

51. Central Sugar cane breeding research institute is situated at

(a) Lucknow

(b) Delhi

(c) Coimbatore

(d) Bhopal

52. Electrofusion or chemofusion is used for-

(a) Cloning

(b) Mutations

(c) Protoplast fusion

(d) Eugenics

53. Improved varieties of wheat suitable for Indian climates have been developed by

(a) hybridisation and mutation

(b) mutation and cloning

(c) cloning of polyploids

(d) polyploidy and hybridization

54. Which one of the following pairs is correctly matched ?

(a) Inbreeding: Cross pollination

(b) Hybrid vigour: Lost due to inbreeding depression

- (c) Male sterility: Self pollination (d) Triticum boeoticum: First domesticated wheat
55. Scientists are trying to get hybridisation between tomato and potato. The most accurate name would be
(a) topemo (b) mopato (c) pomato (d) totempo
56. Correct chronological order of the events occurring during callus culture is -
(a) Callus → Cell division → Explant → Addition of cytokinin → Acquire meristematic property
(b) Explant → Callus → Cell division → Addition of cytokinin → Cells acquire meristematic property
(c) Explant → Cell division → Callus → Addition of cytokinin → Cells acquire meristematic property
(d) Callus → Explant → Cell division → Addition of cytokinin → Cells acquire property.
57. Hybrid vigour is eroded through -
(a) Repeated crossing (b) Repeated selection (c) Vegetative propagation (d) Repeated selfing
58. Desired improved varieties of economically useful crops are raised by
(a) Natural selection (b) Hybridisation (c) Mutation (d) Biofertiliser
59. Mutations in red grained Sonara 64 variety of wheat resulted in the amber grain colour mutant
(a) Larma Rojo 64A (b) Sharbati Sonara (c) Pusa Lerma (d) K-68
60. A transgenic food crop which may help in solving the problem of night blindness in developing countries is -
(a) Bt. soybean (b) Golden rice (c) FlavrSavr tomatoes (d) Star Link maize
61. Which of the following is linked to the discovery of Bordeaux mixture as a fungicide.
(a) Loose smut of wheat (b) Black rust of wheat (c) Bacterial leaf blight of rice (d) Downy mildew of grapes
62. Farmers in a particular region are concerned that premature yellowing leaves of pulse crop might decrease the yield. Which treatment could be beneficial to obtain maximum seed yield.
(a) Frequent irrigation of crop
(b) Treatment of the plants with cytokinin along with a small dose of nitrogen fertilizer
(c) Removal of all yellow leaves and spray the remaining green leaves with 2, 4-dichlorophenoxy acetic acid
(d) Application of iron and magnesium to promote synthesis of chlorophyll.
63. Blindness is prevented by use of which crop most correctly?
(a) Golden rice (b) Wheat (c) Maize (d) Oat
64. Selection of homozygous plant is
(a) Mass selection (b) Pure line selection (c) Mixed selection (d) None of the above
65. Select the correct statement(s) -
I. IARI has released a mustard variety rich in vitamin C.
II. Pusa Sawani variety of Okra is resistant to aphids
III. Hairiness of leaves provides resistance to insect pests
IV. Agriculture accounts for approximately 33% of India's GDP and employs nearly 62% of the population.
(a) I and II (b) II and III (c) I, III and IV (d) None
66. Pure line breeds refer to
(a) Homozygosity and independent assortment (b) Homozygosity only
(c) Heterozygosity (d) Heterozygosity and linkage
67. Mature embryos are mostly
(a) Autotrophic (b) Heterotrophic (c) Parasitic (d) Symbiotic
68. The technique of obtaining large number of plantlets by tissue culture method is called

- (a) Organ culture (b) Micropropagation (c) Macropropagation (d) Plantlet culture
69. The ability of plant cell to give rise to an entire new plant is called
 (a) Symmetry (b) Differentiation (c) Totipotency (d) Dedifferentiation
70. In tissue culture medium, the embryoids formed from pollen grains is due to
 (a) Cellular totipotency (b) Organogenesis (c) Double fertilization (d) Test tube culture
71. Culturing of isolated plant organs is called
 (a) Organ culture (b) Explant culture (c) Organism culture (d) Both (a) and (b)
72. The new varieties of plants are produced by
 (a) Introduction and selection (b) Mutation and selection
 (c) Selection and hybridization (d) Introduction and Mutation.
73. A novel technique devised to produce vast quantities of strong and healthy plantlets by rapid vegetative multiplication under controlled conditions.
 (a) Anther culture (b) Polymerase Chain Reaction (c) Micropropagation (d) Protoplast fusion
74. Haploid plantlets can be produced by
 (a) Pollen culture (b) Cotyledon culture (c) Embryo culture (d) Meristem culture
75. A crop-produce should provide the optimum nutrition and must not contain an :
 (a) Amino nutritional factor (b) Cysteine
 (c) Polyunsaturated fatty acids (d) Lysine
76. Which one of the following substance is responsible for callus formation
 (a) 2,4-D (b) NAA (c) BAP (d) PEG
77. Sterilization means
 (a) Inactivation of microorganisms (b) Temporary destruction of microorganisms
 (c) Complete destruction or killing of microorganisms (d) Induction of immunity in microorganisms
78. A major application of embryo culture is
 (a) Production of embryoids (b) Overcoming hybridisation barriers
 (c) Induction of somaclonal variations (d) Clonal propagation
79. The substance used for solidification of nutrient medium is
 (a) 2,4-D (b) Agar agar (c) Alfa-alfa (d) Yeast
80. Who gave the idea that every plant cell is totipotent
 (a) PR. White (b) E.G. Cocking (c) F.C. Steward (d) G. Liaberlandt
81. The emasculation of flower buds is achieved by the removal of
 (a) Stigma (b) Anthers (c) Sepals (d) Corolla.
82. Which one of the following is not a secondary metabolite?
 (a) Resins (b) Essential oils (c) Amino acids (d) Tannins
83. Hybrid vigour is mostly due to
 (a) Heterozygosity
 (b) Superiority of all the genes
 (c) Homozygosity of pure characters
 (d) Mixing up of cytoplasm of the male with that of female exclusively.

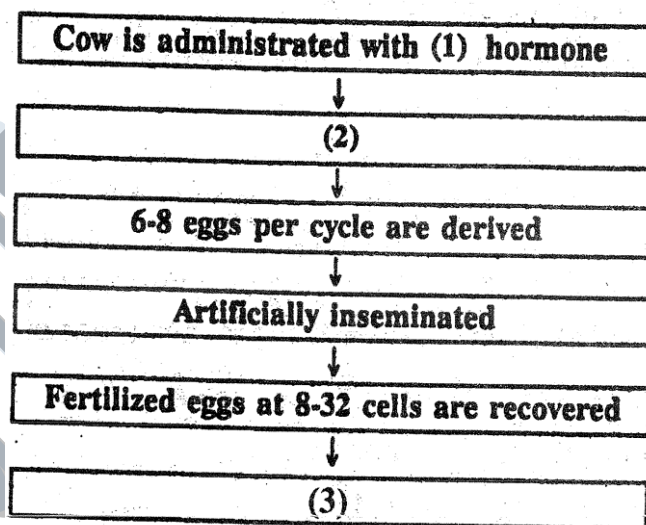
84. In hybridisation, the haploids combine the advantages of
 (a) Recombination (b) Segregation (c) Fixation (d) All of them
85. Plants having similar genotypes produced by plant breeding are called
 (a) Clone (b) Haploid (c) Autopolyploid (d) Genome
86. 'Norin gene' of dwarfness in wheat originated through spontaneous mutation in
 (a) India (b) Japan (c) Mexico (d) U.S.S.R.
87. An unorganised mass of cells is called
 (a) Totipotent (b) Explant (c) Callus (d) Corax
88. Most nutritious among the following is-
 (a) Wheat (b) Maize (c) Bajra (d) Rice
89. Select the correct statements-
 (a) Our present day crop plants are entirely different from their wild ancestors as almost all our present day crops are the result of selections carried out by the prehistoric human beings
 (b) Almost all our present day crops are the result of selections carried out by the prehistoric human beings.
 (c) Feeding of rarer plants into agriculture and horticulture trade is of great advantage to genetic conservation.
 (d) All of the above
90. In the hexaploid wheat, the haploid (n) and basic (x) number of chromosomes are
 (a) $n = 21$ and $x = 21$ (b) $n = 21$ and $x = 14$ (c) $n = 21$ and $x = 7$ (d) $n = 7$ and $x = 21$
91. Select the correct statements -
 (a) A gene bank should not be regarded as a plant museum.
 (b) The germplasm, stored in the gene bank are actively utilized by breeders to develop novel varieties.
 (c) The phase between 1960-1970 is often called the Green Revolution.
 (d) All of the above
92. Somaclonal variation can be obtained by
 (a) Application of colchicine (b) Hybridisation
 (c) Irradiation with gamma rays (d) Tissue culture
93. Which of the following is the consequence of plant diseases?
 (a) Reduced yield and lower quality of produce
 (b) Reduced yield, lower quality of produce and increased cost of production -
 (c) Reduced yield, lower quality of produce and poisonous produce
 (d) Reduced yield, lower quality of produce, increased cost of production and poisonous produce
94. India's wheat yield revolution in the 1960s was possible primarily due to
 (a) Increased chlorophyll content (b) Mutations resulting in plant height reduction
 (c) Quantitative trait mutations (d) Hybrid seeds
95. Which part of the plant is best suited for making virus free plants ?
 (a) Apical meristem (b) Lenticels (c) Bark of stem (d) Root cap
96. Most cultivated plants are
 (a) Autopolyploids (b) Allopolyploids (c) Aneuploids (d) Haploids
97. Fill up the blanks-

Saccharum barberi was originally grown in north India, but had A sugar content and yield. Tropical canes grown in south India *Saccharum officinarum* had B stems and C sugar content but did not grow well in north India. These two species were successfully crossed to get sugar cane varieties combining the desirable qualities of high yield, stems, E sugar and ability to grow in the sugar cane areas of F India.

- (a) A - poor, B - thick, C - high, D - thicker, E - higher, F - north
 (b) A - poor, B - thicker, C - higher, D - thick, E - high, F - north
 (c) A - poor, B - thinner, C - higher, D - thin, E - high, F - north
 (d) A - poor, B - thicker, C - higher, D - thick, E - high, F - south

98. A self fertilizing trihybrid plant forms
 (a) 4 different gametes and 16 different zygotes (b) 8 different gametes and 16 different zygotes
 (c) 8 different gametes and 32 different zygotes (d) 8 different gametes and 64 different zygotes
99. Which one of the following is a viral disease of poultry?
 (a) Coryza (b) New Castle disease (Rani khet)
 (c) Pasteurellosis (d) Salmonellosis
100. A cybrid is a hybrid carrying
 (a) cytoplasm of two different plants
 (b) genomes and cytoplasm of two different plants
 (c) cytoplasm of two different plants and genome of one plant
 (d) genomes of two different plants
101. Norman Borlaug known as "Father of Green Revolution" has developed new cultivating crops of-
 (a) Paddy (b) Rice (c) Wheat (d) Sugarcane
102. Triticum aestivum, the common bread wheat is
 (a) Triploid with 21 chromosomes (b) Tetraploid with 28 chromosomes
 (c) Hexaploid with 42 chromosomes (d) Diploid with 14 chromosomes
103. In maize, hybrid vigour is exploited by
 (a) Crossing of two hybrid parental lines (b) Harvesting seeds from the most productive plants
 (c) Inducing mutations (d) Bombarding the seeds with DMA
104. Man made crop "Triticale" is a Hybrid between-
 (a) Wheat and Rye (b) Rice and Barley (c) Maize and Barley (d) Rice and Maize
105. Embryo rescue is used for
 (a) Establishing suspension culture (b) Recovery of interspecific hybrids / difficult hybrids
 (c) Somatic hybridization (d) Haploid production
106. Colchicine brings about
 (a) Chromosome aberrations (b) Duplication of chromosomes
 (c) Gene mutations (d) Quick replication
107. Which of the following hybrid varieties of crop plants has been developed in India -
 (a) Hybrid Maize and Hybrid Wheat (b) Hybrid jowar and Hybrid Bajra
 (c) Hybrid Garden Pea (d) All of these
108. Which of the following is not HYV of paddy?
 (a) Java (b) Pusa-205 (c) Ratna (d) Hira-Moti.
109. The technique of obtaining large number of plantlets by tissue culture method is called
 (a) Organ culture (b) Micropropagation (c) Macropropagation (d) Plantlet culture
110. Three crops that contribute maximum to global food grain production are-
 (a) Wheat, rice and maize (b) Wheat, rice and barley

- (c) Wheat, maize and sorghum (d) Rice, maize and sorghum
111. Which pairing is correct?
 (a) Sericulture - Fish (d) Pisciculture - Birds (c) Apiculture - Honeybee (d) Aquaculture - Mosquito
112. Fill in the blanks –
 Semi-dwarf rice varieties were derived from A, (developed at International Rice Research Institute (IRRI), J. Philippines) and Taichung Native-1 (from B.) The derivatives were introduced in C. Later better-yielding semidwarf varieties *Jaya* and *Ratna* were developed in D.
 (a) A - IR-8, B-Japan, C-1966, D-India (b) A-IR-32, B-Taiwan, C-1966, D-India
 (c) A-IR-8, B-Taiwan, C-1966, D-India (d) A-IR-8, B - Taiwan, C-1966, D-USA
113. New methods of obtaining plant breeds includes -
 (a) inducing mutations in plants and then screening for resistant plants
 (b) selection among somaclonal variants
 (c) plants obtained by genetic engineering.
 (d) All
114. Following methodology has been used for cattle, sheep, buffaloes etc.



- (a) 1 - FSH, 2 - Superovulation due to induced follicular maturation, 3 -Transfer to surrogate mother
 (b) 1 - LH, 2 - Superovulation due to induced follicular maturation, 3 - Transfer to surrogate mother
 (c) 1 - Progesteron, 2 - Superovulation due to induced follicular maturation, 3 - Transfer to surrogate mother
 (d) 1 - Estrogen, 2 - Superovulation due to induced follicular maturation, 3 - Transfer to surrogate mother 3.
115. A hybrid where cytoplasms of two parent cells are fused by retaining only one parental nucleus is called
 (a) Hybrid (b) Interbreed
 (c) Asymmetric somatic hybrid (d) Symmetric somatic hybrid.
116. IPGRI is abbreviation of
 (a) International Plant Genetic Resource Institute (b) International Pine Genetic Resource Institute
 (c) International Potato Genetic Resource Institute (d) Indian Plant Genetic Resource Institute.
117. Cultivation of 'Bt' cotton has been in the rewy. The prefix 'Bt' means-
 (a) Barium-treated cotton seeds
 (b) Bigger thread variety of cotton with better temile strength

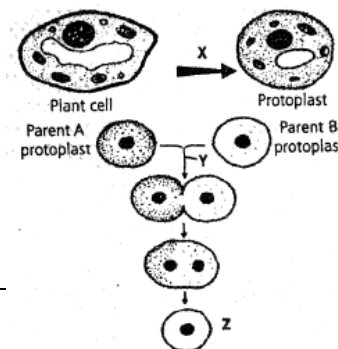
- (c) Produced by "Biotechnology" using restriction enzymes
(d) Carrying an endotoxin gene from *Bacillus thuringiensis*.
118. Callus can form shoot or root by changing ratio of
(a) Auxin to gibberellin (b) Auxin to cytokinin (c) Cytokinin to ethylene (d) Gibberellin to cytokinin
119. An improved variety is
(a) Always superior to the other existing varieties (b) Always inferior to the other existing varieties
(c) May be superior to the other existing varieties (d) More than one answer is correct
120. The flowers of which plant are not pollinated by bee?
(a) Sunflower (b) Brassica (c) Apple and Pear (d) None of these
121. Haploids are more suitable for mutation studies than diploids. This is because
(a) Haploids are more abundant in nature
(b) All mutations, whether dominant or recessive, are expressed in haploids
(c) Haploids are re productively more suitable than diploids
(d) Mutagens penetrate in haploids more effectively than in diploids.
122. Shoot develops in tissue culture when there is
(a) High gibberellin cytokinin ratio (b) High gibberellin auxin ratio
(c) High auxin : cytokinin ratio. (d) High cytokinin : auxin ratio.
123. Somatic hybridization is accomplished by
(a) Fusion of two protoplasts from similar species (b) Fusion of two protoplasts from two species
(c) Chromosome doubling in androgenic cultures (d) Fusion of two protoplasts from sperm and egg
124. Borlaug developed new varieties of
(a) Wheat (b) Rice (c) Sugarcane (d) Mango.
125. Which of the following is a domesticated insect?
(a) Ants (b) Bees (c) Fleas (d) Wasps
126. Haploids of *Datura* were obtained through
(a) Embryo culture (b) Meristem culture (c) Callus culture. (d) Anther culture.
127. Honeybee species reared most widely in India is-
(a) *Apis indica* (b) *Apis florea* - (c) *Apis dorsata* (d) *Apis mellifera*
128. Mutational breeding has produced the variety of mung bean which is resistance to-
(a) yellow mosaic virus (b) powdery mildew (c) Both (a) and (b) (d) White rust
129. Norman Borlaug is associated with
(a) White revolution (b) Green revolution (c) Blue revolution (d) Yellow revolution.
130. Constraints of conventional breeding are -
(a) limited number of disease resistance genes (b) difficult identification of desirable genes,
(c) Both (d) None
131. The technique of raising large number of plantlets through tissue culture is
(a) Plantlet culture (b) Micropropagation (c) Macropropagation (d) Organ culture.
132. An important germplasm storing centre in India is -
(a) CDRI (b) FRI (c) ICRISAT (d) NEERI. ,

133. Bees are important for -
 (a) Honey yield only (b) Crop yield only (c) Both (d) pollination in maize
134. Select the false statement(s).
 (a) Agriculture accounts for approximately 33% of India's GDP and employs nearly 62% of the population.
 (b) *Saccharum barberi* was originally grown in north India, but had poor sugar content and yield.
 (c) Hybrid maize, jowar and bajra have been successfully developed in India.
 (d) None
135. Which of the following is incorrect w.r.t. SCP?
 (a) Quantitatively and qualitatively superior proteins
 (b) Production involves utilisation of organisms which has high rate of biomass production and growth
 (c) Can be obtained from both unicellular and multicellular organisms
 (d) 250 g of *Methylophilus methylotrophus* can produce 20 tonnes of protein per day
136. Which is / are common fresh water fishes?
 (a) Catla and Rohu (b) Rohu, Common carp and Catla
 (c) Tiger fish (d) None
137. Cereals and millets are mainly deficient in which amino acids?
 (a) Sulphur containing amino acids-methionine and cysteine
 (b) Lysine
 (c) Tryptophan
 (d) Both (b) & (c)
138. Which one is correct about Atlas 66?
 (a) It has high protein content.
 (b) It has been used as a donor for improving cultivated wheat.
 (c) Both (a) and (b) (d) None
139. Which of the following is an example of intergeneric hybridization?
 (a) *Triticale* (b) *Raphanobrassica* (c) *Gossypium hirsutum* (d) More than one is correct
140. Which statement(s) is correct?
 (a) haploid culture technique was developed by Guha and Maheshwari
 (b) A line consists of a group of individuals related by descent and having similar genotype.
 (c) Mutation is a sudden heritable change in character of an organism.
 (d) All of the above
141. Evaluation of new variety in India is done by
 (a) IARI (b) IVRI (c) ICAR (d) RR!
142. Which of the followings has been developed by India?
 (a) Lysine and tryptophan rich varieties of maize. (b) High protein variety of wheat
 (c) Iron fortified variety of rice (d) All
143. Gene responsible for dwarfing in wheat is
 (a) *dee-geo-woo-gen* (b) *norin-10* (c) *crygene* (d) *nod gene*

144. The conventional method of breeding for resistance includes which of the following steps?
 (a) Screening the germ plasm for resistant sources and hybridization of selected parents.
 (b) Selection and evaluation of the hybrids and testing and release of new varieties.
 (c) Both a and b
145. Scented basmati rice is the contribution of
 (a) Borlaug (b) B.P. Paul (c) M. S. Swaminathan (d) A. K. Singh
146. Select the correct statement(s)-
 (a) Micropropagation is the production of small plants. (b) The source of single cell protein is microbes
 (c) IARI has released a mustard variety rich in vitamin C. (d) Both b and c
147. The dwarf wheat varieties brought from Mexico into India were
 (a) Son ka (b) Sharbati Sonara and Pusa Lerma
 (c) Sonara-64 and Lerma Rojo-64 (d) Sonara-64 and Son ka
148. The objectives of breeding improved nutritional quality of crops are to increase -
 (a) Protein content and quality only (b) Oil/fat content and quality only
 (d) Vitamin content and Mineral nutrients (d) All of the above
149. Maize is rich in
 (a) Thiamine (b) Lysine (c) Tryptophan (d) Alanine
150. Which one is the real product of honeybee?
 (a) Pollen (b) Honey (c) Propolis (d) Beewax
151. Which was first Indian dwarf amber grained variety of wheat made from sonora 64 by y-rays (gamma rays)?
 (a) Son ka (b) Sharbati sonora (c) Kalyan song (d) HUW-468
152. The wax gland in honeybee is found in -
 (a) Drone (b) Worker (c) Queen (d) Worker and queen
153. Pure line variety of wheat is
 (a) Sonara.63 (b) Sonara64 (c) HUW468 (d) All of these
154. Which is / are common marine fishes?
 (a) Hilsa, Sardines, Mackerel and Pomfrets (b) Catla -:
 (c) Rohu (d) Common carp
155. High yielding, semi dwarf varieties of rice are -
 (a) *Jaya* and *Ratna* (b) *Jaya*, *Ratna* and IR-8 (c) Aruna (d) All of these
156. Cryopreseivation is done at temperature-
 (a) -140°C (b) -120°C (c) 196°C (d) -273°C
157. Multiple ovulation and embryo transfer in the method of-
 (a) Fish cultivation (b) Prawn cultivation (c) Cloning mar keep (d) Hybridisation in cattle
158. Heating milk at 65°C followed by sudder cooling is known as-
 (a) Sterilisation (b) Preservation (c) Pasteuristion (d) Fermentation
159. Zoological name of Indian Buffalo is-
 (a) Bubalas Buldas (b) Bos indicus (c) Bos Tames (d) Galus galus
160. Perire in a disease of-

- (a) Cattle (b) Silkworm (c) Hen (d) Fish
161. Bulls sener is stored is-
 (a) Ice (b) Liquid N₂ (c) Liquid CO₂ (d) Liquid O₂
162. Which pair is essential for the growth of fish in water-
 (a) Nitrates and sulphates (b) Sulpharates and carbonates
 (c) Calcium and phosphorus (d) Carbonates and phosphates
163. Match the Column A with Column B –
- | Column A | Column B |
|---|-------------------------|
| I. Many people have deficiencies as they cannot buy fruits & vegetables | A. Single cell proteins |
| II. Crops with higher vitamins, proteins and fats are bred | B. Micropropagation |
| III. Growing microbes as the alternative source of proteins | C. Somaclones |
| IV. Capacity to generate plant from single cell or explant | D. Hidden hunger |
| V. Production of thousand plants through tissue culture | E. Biofortification |
| VI. Genetically identical plants | F. Totipotency |
- (a) I - D, II - E, III - F, IV - A, V - B, VI - C (b) I - D, II - E, III - F, IV - A, V - C, VI - B
 (c) I - D, II - E, III -A, IV - F, V - B, VI - C (d) I - F, II - E, III -A, IV - D, V - B, VI – C
164. Which statement is correct?
 A. The maintenance of hives of honeybees for the production is called apiculture.
 B. A group of animals related by descent and similar in most characters are called a breed.
 C. The agricultural practice of breeding and raising livestock is called animal husbandry.
 D. The ability of plant cells to regenerate into complete plant is called somaclonal variation.
 (a) A and B (b) BandC (c) CandD (d) A, B, C
165. Which of the following crop plant is not matching as correct pair with its variety.
 I. Wheat Himgiri
 II. Brassica PusaGaurav
 III. Cauliflower Pusa Komal
 IV. Chilli Pusasadabahr
 V. Okra Pusa sawani
 (a) only I (b) II and III (c) only III (d) III and IV
166. Cryopreservation is
 A. preservation at ultra low temperature
 B. preservation in liquid nitrogen D. preservation of semen
 C. preservation through exposure to gamma rays
 (a) A and B (b) BandC (c) C and D (d) A,B,C, D

167. Refer to the following process of somatic hybridisation. Identify X, Y and Z.
- (a) X - Cellulase & pectinase, Y - Polyethylene glycol, Z - Somatic hybrid cell
 (b) X - Proteinase, Y - Polyethylene glycol, Z - Somatic hybrid cell
 (c) X - CelluSase & pectinase, Y - Proteinase, Z - Somatic hybrid cell



(d) X - Cellulase & pectinase, Y - Polyethylene glycol, Z - Zygotic cell¹².

168. Given below are four statements (A to D) each with one or two blanks, select the option which correctly fills up the blanks in the statements :

Statements:

A. Use of chemicals or radiation in inducing _____ to develop improved varieties of plants is called _____. B. _____ deals with the Culturing and rearing of freshwater organisms and the production of fishes is called _____. C. An organism or its karyotype having more than two genomes is called _____. D. _____ is a larvivorous fish which eat larva of mosquito.

Options:

- (a) A- Mutation, Mutation breeding; B - Pisciculture, Aquaculture; C - Polyploid; D - Gambusia
(b) A- Mutation, Mutation breeding; B - Aquaculture, Pisciculture; C - Haploid; D - Gambusia
(c) A- Mutation, Mutation breeding; B -Aquaculture, Pisciculture; C - Polyploid; D - Gambusia
(d) A- Mutation, Cross breeding; B -Aquaculture, Pisciculture; C - Polyploid; D - Gambusia
169. Which one is a source of single cell protein?
A. *Nostoc* B. *Spirulina* C. *Chlorella* D. *Scenedesmus*
(a) A and B (b) B and C (c) C and D (d) B, C, D
170. Identify the following commercial varieties among wheat and rice
I. Son ka A. Semi Dwarf Wheat
II. Kalyansona B. Semi Dwarf Rice
III. IR-8
IV. Java
V. Taichung Native-1
VI. Ratna.
(a) A-I, III, V; B-II, IV, VI (b) A-III, IV, V, VI; B-1, II (c) A-I, II, IV; B-III, V, VI (d) A-I, II; B-III, IV, V, VI
171. Which one is a chemical mutagen?
A. Ethylmethane sulphonate B. Sodium azide
C. Gamma rays D. 2, 4-D
(a) A and B (b) B and C (c) C and D (d) A, B, C, D
172. Which is / are false?
(a) Semen is preserved for artificial insemination by heating.
(b) Most common bee species in India is *Apis indica*.
(c) Example of interspecific hybridisation is Mule.
(d) Artificial insemination is injecting the semen into the vagina for female.
173. Identify the false statements -
I. One of the objectives of plant breeding is to develop disease, insect and pest resistant varieties.
II. Plant breeding is both art and science.
III. Catla and Rohu are the most eaten marine fishes in our country.
IV. South Indian sugarcane variety *Saccharum officinarum* has thinner stem and lower sugar content than the North Indian one.
(a) I and II (b) III and IV (c) All (d) None
174. Match the Column A with Column B-

Column A

Column B

- A. Emasculation (i) Source of genetic variations occurring in all organisms today
 B. Allopolyploidy (ii) Removal of anthers from a bisexual flower
 C. Inbreeding depression (iii) Introduction of new weeds, pests and diseases along with introduced varieties
 D. Outcrossing (iv) Mating of animals within the same breed but do not have common ancestors
 E. Hybridisation (v) Male and female animals of two different but related species are mated (Interspecific hybridization)
 F. Spontaneous mutation (vi) Contains multiple sets of chromosomes derived from different species
 G. Quarantine (vii) Crossing of genetically different parents for bringing genetic variation in the progeny
 H. Mule (viii) Reduced fertility and even productivity

- (a) A - (ii), B - (vi), C - (viii), D - (iv), E - (vii), F - (i), G - (iii), H - (v)
 (b) A - (ii), B - (vi), C - (viii), D - (vii), E - (iv), F - (i), G - (iii), H - (v) ;
 (c) A - (ii), B - (vi), C - (viii), D - (iv), E - (I), F - (iii), G - (v), H - (vii)
 (d) A - (ii), B - (iv), C - (vi), D - (viii), E - (vii), F - (v), G - (iii), H - (i)

175. Given below are five statements (A to E) each with one blank. Select the option which correctly fills up the blanks in the statements:

Statements:

- A. For the process of hybridisation, selfing of parents is done, to reduce the _____.
 B. Performance of a crop or an animal depends mainly on its genotype and the _____ in which it is grown.
 C. An _____ is excised from its original location and used for initiating a culture.
 D. The scientific name of Indian cattle is _____.
 E. MOET (multiple ovulation embryo transfer) is a method of _____.

Options:

- (a) A - Heterozygosity; B - Environment; C - Implant; D - *Bos indicus*; E - Controlled breeding.
 (b) A - Homozygosity; B - Environment; C - Explant; D - *Bos indicus*; E - Controlled breeding.
 (c) A - Heterozygosity; B - Environment; C - Explant; D - *Bos indicus*; E - Controlled breeding.
 (d) A - Hemizygosity; B - Environment; C - Explant; D - *Bos indicus*; E - Controlled breeding.

176. Which of the following matching is correct?

- (a) Green Revolution — Crop plant (b) Blue Revolution — Fishery
 (c) White Revolution — Milk producing cattle (d) All of the above

177. Which one is also included in animal husbandry?

- A. Poultry farming B. Fish farming C. Organic farming D. Molecular farming
 (a) A and B (b) B and C (c) C and D (d) A, B, C and D

178. Exotic breeds are

- A. used for cross breeding B. hardy
 C. to be provided specific environment D. resistant to local pests and pathogens
 (a) A and B (b) B and C (c) C and D (d) A, C

179. Which of the following is a source of single cell protein?

- A. *Saccharomyces* B. *Torulopsis* C. *Candida* D. *Fusarium*
 (a) A and B (b) B and C (c) C and D (d) A, B, C

180. Which of the following is a variety of rice?

- A. Bala B. Kalyan sons C. Jaya D. Sonars 64
 (a) A and B (b) B and C (c) A, C (d) A, B, C, D

181. Which one is a rich source of vitamin A?

- A. Carrot B. Spinach C. Lemon D. Beans
 (a) A and B (b) B and C (c) C and D (d) A, B, C, D

182. Which factors are responsible for development of disease in a plant?

- A. Susceptible host B. Aggressive pathogen C. Conducive environment D. Excess of fertilizer
 (a) A and B (b) B and C (c) C and D (d) A, B, C

183. Identify the true statements-
- Pullorum disease of poultry is caused by virus.
 - Drones are produced by parthenogenesis.
 - Heterosis or hybrid vigour is the phenotypic superiority of the hybrid over either of its parents in one or more traits.
 - A clone contains and expresses genetically engineered gene known as transgene.
 - Cross breeding is practised to develop homozygous pureline.
- (a) I, IV and V (b) II and III (c) All (d) None

184. The development and flourishing of fishery industry has led to
- (a) Green revolution (b) Blue revolution (c) Silver revolution (d) White revolution

185. Match the Column A with the Column B - Column A

Column A

- Sericulture
- Pisciculture
- Apiculture
- Tissue culture
- Green Revolution
- White Revolution
- Blue Revolution

- (a) I - D, II - C, III - B, IV - A, V - F, VI - G, VII - E
(c) I - A, II - B, III - C, IV - D, V - F, VI - G, VII - E

Column B

- Beekeeping
- Rearing of silkworm
- Micropropagation
- Rearing of fishes
- Fish
- Crop plants
- Milk

- (b) I - D, II - A, III - B, IV - C, V - G, VI - F, VII - E
(d) I - B, II - D, III - A, IV - C, V - F, VI - G, VII - E

186. In live stock breeding experiments the following stage is transferred to surrogate mothers
- (a) Unfertilized eggs (b) Fertilized eggs (c) 8 to 32 celled embryo (d) Frozen semen

187. The following process of breeding increases homozygosity
- (a) Inbreeding (b) Out breeding (c) Cross breeding (d) Inter-specific breeding

188. The animal husbandry deals with the care, breeding and management of
- (a) Domesticated animals (b) Fishes
(c) Honey bees and silk worms (d) All of these

189. Match the Column A with the Column B - Column A

Column A

- Follicle-stimulating hormone
- Lathyrus sativus*
- Lerma rojo*
- Ganga-5
- Jassids VS. *Spirulina*
- In vitro* clonal propagation

- a) I - C, II - D, III - B, IV - A, V - G, VI - F, VII - E
(c) I - C, II - D, III - B, IV - E, V - G, VI - F, VII - A

Column B

- Maize
- Dwarf variety
- Super ovulation
- BN-oxalyalamine alamine
- Cotton
- SCP
- Micropropagation

- (b) I - C, II - D, III - B, IV - A, V - E, VI - F, VII - G
(d) I - C, II - D, III - A, IV - B, V - G, VI - F, VII - E

190. The fishery does not include the rearing, catching and processing of
- (a) Crabs and corals (b) Squids and lobsters
(c) Aquatic plants of commercial importance (d) All of these

191. Some crop varieties bred by hybridisation and selection, for disease resistance to fungi, bacteria and viral diseases are released. Fill up the blanks -

Crop	Variety	Resistance to diseases
Wheat	_____ A _____	Leaf and stripe rust, hill bunt
_____ B _____	Pusa swarnim (Karan rai)	White rust
_____ C _____	Pusa Shubhra, Pusa Snowball K-1	Black rot and Curl blight black rot
Cowpea	Pusa Komal	_____ D _____
Chilli	_____ E _____	Chilly mosaic virus, Tobacco mosaic virus & Leaf curl

- (a) A - Himgiri, B - Brassica, C - Cauliflower, D - Bacterial blight, E - Pusa Gaurav
(b) A - Himgiri, B - Brassica, C - Flat bean, D - Bacterial blight, E - Pusa Sadabahar
(c) A - Brassica, B - Himgiri, C - Cauliflower, D - Bacterial blight, E - Pusa Sadabahar
(d) A - Himgiri, B - Brassica, C - Cauliflower, D - Bacterial blight, E - Pusa Sadabahar

192. When two unrelated individuals or lines are crossed, the performance of F1 hybrid is often superior to both its parents. This phenomenon is called
 (a) Metamorphosis (b) Heterosis (c) Transformation (d) Sphen
193. 'Himgiri' developed by hybridisation and selection for disease resistance against rust pathogens is a variety of
 (a) Wheat (b) Chilli (c) Maize (d) Sugarcane
194. India and China have more than 70% of world live stock population and produce following percentage of world farm produce
 (a) 10% (b) 25% (c) 40% (d) 50%
195. The rearing of domesticated fowl is called
 (a) Piggery (b) Apiary (c) Poultry (d) Dairy farming
196. *Hisardale* is a new breed of sheep developed in Punjab by crossing
 (a) Marino ram and Bikaneri ewe (b) Assel ram and white leg horn ewe
 (c) Rhode Island ram and white leg horn ewe (d) Cochin ram and Ghagus ewe
197. 'Lean meat' is considered to be of high quality since it has
 (a) Lesser but easily digestible protein (b) Lesser lipid content
 (c) More fat that makes the meat softer (d) Longer shelf life due to lesser chances of infection
198. The 'Mule' is the result of
 (a) Inbreeding depression (b) Outbreeding (c) Cross breeding (d) Inter-specific hybridization
199. Some released crop varieties bred by hybridisation and selection, for insect pest resistance are given. Fill up the blanks •

Crop	Variety	Insect Pests
Brassica (rapeseed mustard)	Pusa Gaurav	<u>A</u>
<u>B</u>	Pusa Sem 2, Pusa Sem 3	Jassids, aphids and fruit borer
<u>C</u>	Pusa Sawani Pusa A-4	Shoot and Fruit borer

- (a) A - Flat bean, B - Aphids, C - Okra (Bhindi) (b) A-Aphids, B - Flat bean, C - Cauliflower
 (c) A-Aphids, B-Flat bean, C - Okra (Bhindi) (d) A - Virus, B - Flat bean, C - Okra (Bhindi)
200. The drug used for deforming the poulting birds is-
 (a) Antihistamine (b) Antiviral (c) Anthelmithic (d) Antibiotic
201. Green revolution in India occurred during:
 (a) 1960.s (b) 1970.s (c) 1980.s (d) 1950.s
202. Which of the following is given to cow to yield milk-
 (a) Sorbitol (b) Prolactin (c) Gonadotropin (d) None of the above
203. Which one of the following is a breed of cattle?
 (a) Aryshire (b) Ghagus (c) Kadakanath (d) Scampi.
204. Earliest animal to be domesticated by primitive man was-
 (a) Goat (b) Dog (c) Horse (d) Cat
205. Black rot of crucifers is caused by a
 (a) fungus (b) bacterium (c) virus (d) none of these.
206. Honey is-
 (a) Alkaline (b) Acidic (c) Neutral (d) Basic after some days

207. Removal of RNA polymerase III from nucleoplasm will affect the synthesis of:
(a) tRNA (b) hnRNA (c) m RNA (d) rRNA
208. Leucaena leucocephala is-
(a) called subabul in India
(b) a small leguminous plant with edible fruits and seeds
(c) a fodder plant as its pods and leaves are consumed by cattle
(d) All the above
209. Which of the following plants is used to treat bone fractures-
(a) Digitaria purpurea (b) Hevea brasiliensis (c) Cissus quadrangularis (d) Lawsonia inermis
210. Axenic culture is-
(a) Culture of gene
(b) Pure culture of a microbe without any nutrient
(c) Pure culture without any contamination
(d) None of the above
211. Hydroponics is the method of-
(a) Water conservation (b) Plant development in water without soil
(c) Plant development without soil (d) Plant development in saline soil.
212. The term pure lines was introduced by-
(a) Johannsen (b) Vavilov (c) Verarmann (d) Borlaug
213. Pure savana in a Lybird variety of-
(a) Brassica (b) Flat bean (c) Bhindi (d) Maize
214. In a colony of Honeybee family there are-
(a) lots of workers, one drone, one queen
(b) lots of workers, few drones, one queen
(c) few workers, few drones, one queen
(d) lots of workers, lots of drones, one queen
215. Lac insect (Laccifer lacca)
(a) Produces resinous secretion on Cyas tree
(b) is distributed in Asia and Africa
(c) Is studied extensively in India at lac research institute
(d) Produces resinous secretion on fig family
216. Honey of bee is sweet as it contains-
(a) Sucrose (b) Glucose (c) Fructose (d) Maltose
217. Highest milk producing breed is-
(a) Jersey (b) Sahiwal (c) Friesian-Holstein (d) None of these
218. Which of the following is a drought breed of Indian cattle.
(a) Malvi (b) Gir (c) Sahiwal (d) Deori
219. Which of the following is a type of silk produced entirely in south India-
(a) Eri (b) Mulberry (c) Tussan (d) Muga
220. Which of the following is a breed of cattle-
(a) Malvi (b) Nagori (c) Hallikan (d) Sahiwal

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	a	d	d	d	c	a	a	a	b	c	a	b	b	c	a	a	d	d	a	a
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	b	d	d	a	a	c	b	b	b	d	b	c	c	c	c	b	d	b	c	a
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	a	a	d	a	c	c	a	b	d	d	c	d	d	b	a	a	d	b	d	d
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	d	b	c	b	a	b	c	b	b	c	b	c	a	d	d	b	a	d	a	d
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	a	c	b	a	d	b	b	c	d	c	b	b	c	a	b	d	c	b	a	a
Ques.	101	102	103	104	105	106	107	108	109											
Ans.	b	c	c	c	a	a	d	c	d											

10

MICROBES IN HUMAN WELFARE

- Which of the following fixes atmospheric nitrogen-
(a) Nostoc (b) Algae (c) Methadones (d) None
- Pasteurization takes place at-
(a) 30°C for 60 minutes (b) 40°C for 30 minutes (c) 62°C for 30 minutes (d) 30°C for 20 minutes
- Ethyl alcohol is commercially manufactured from-
(a) Bajra (b) Grapes (c) Maize (d) Sugar cane
- Symbiotic association is exhibited by
A. mycorrhiza. B. *Rhizobium* C. heterocyst D. Yeast
(a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B
- The technology of biogas production in India has been developed by the efforts of
A. Khadi and Village Industries Commission (KVIC) B. Indian Council of Agricultural Research (IARI)
C. Indian Agricultural Research Institute (IARI) D. Indian Council of Medical Research (ICMR)
(a) A, C, D (b) C, D (c) A, C (d) A, B
- Microbes are diverse which include
A. Bacteria B. Mosses C. Protozoans D. Fungi
(a) A, C, D (b) A, D (c) A, B (d) C, D
- Name the blank spaces a, b, c and d from the table given below:

Type of Microbe	Scientific Name	Product	Medical Application
(i) Fungus	A	Cyclosporin	B
(ii) C	<i>Monascus purpureus</i>	Statin	D

- A - *Trichoderma polyspora*, B - Organ transplant patients, C - Yeast (Fungus), D - Lowering of blood cholesterol
 - A - Lowering of blood cholesterol, B - *Trichoderma polyspora*, C - Organ transplant patients, D - Yeast (Fungus)
 - A - Yeast (Fungus), B - Lowering of blood cholesterol, C - *Trichoderma polyspora*, D - Organ transplant patients
 - A - Organ transplant patients, B - Yeast (Fungus), C - Lowering of blood cholesterol, D - *Trichoderma polyspora*
- Which of the following food items is produced by fermentation by the microbes?
A. Idli B. Dosa C. Toddy D. Cheese
(a) A, B, C, D (b) C, D (c) A, C (d) A, B, C
 - The distillation of the fermented broth is required in the formation of
A. rum B. beer C. brandy D. whisky
(a) A, B, C (b) A, C, D (c) B, C, D (d) A, B, D
 - Microbes are used in
A. primary treatment of sewage B. secondary treatment of sewage
C. anaerobic sludge digester D. production of bioactive molecules

- (a) A, C, D (b) A, B, C, D (c) B, C, D (d) C, D

11. Name the blank spaces a, b, c and d given in the following table

	Scientific Name	Commercial Product
Bacterium	A	Clot buster enzyme
B	<i>Aspergillus niger</i>	Citric acid
Fungus	<i>Trichoderma polysporum</i>	C
Bacterium	D	Butyric acid

(a) A- *Streptococcus*, B - Fungus, C - Cyclosporin-A, D - *Clostridium butylicum*.

(b) A- *Clostridium butylicum*., B - *Streptococcus*, C - Fungus, D - Cyclosporin-A

(c) A - Cyclosporin-A, B - *Clostridium butylicum*., C - *Streptococcus*, D - Fungus

(d) A- Fungus, B - Cyclosporin-A, C - *Clostridium butylicum*., D - *Streptococcus*

12. Microbes are present in -

- A. Soil B. Air C. Water D. Thermal springs

- (a) A, C,D (b)A, B, C, D (c)A, B (d)C,D

13. Which industrial products are synthesized from microbes?

- A. Antibiotics B. Fermented beverages C. Enzymes and chemicals D. Bioactive molecules

- (a) A, C, D (b) A, B, C, D (c) A, C (d) A, B, C

14. Which of the following is used as biofertilizer?

- A. Cyanobacteria B. Yeast C. Symbiotic bacteria D. Free living bacteria

- (a) A, B, C (b)A,B, D (c)A,C,D (d)A, B, D

15. Name the blank spaces A, B, C and D given in the following table :

Type of Microbe	Scientific Name	Commercial, Product
Bacterium	A	Lactic acid
Fungus	B	Cyclosporin A
C	<i>Monascuspurpureus</i>	statins
Fungus	<i>Penicillium notatum</i>	D

(a) A- *Lactobacillus*, B - *Trichoderma polysporum*, C -Yeast (Fungus), D - Penicillin.

(b) A- *Lactobacillus*, B - *Trichoderma polysporum*, C - Yeast (Algae), D - Penicillin.

(c) A - *Lactobacillus*, B - *Trichoderma polysporum*, C - Yeast (Prokaryote), D - Penicillin.

(d) A - *Lactobacillus*, B - *Trichoderma polysporum*, C - *Agaricus* (Fungus), D - Penicillin.

16. Yeasts have been used for the commercial production of

- A. wine B. whisky C. ethanol D. curd
(a) A, B, C (b) A, B, C, D (c) B, C, D (d) A, B, D

17. Which of the following cyanobacteria can fix atmospheric nitrogen?

- A. *Nostoc* B.*Anabaena* C. *Oscillatoria* D. Yeast
(a)A,C, D (b)C,D (c)A,C (d)A,BC

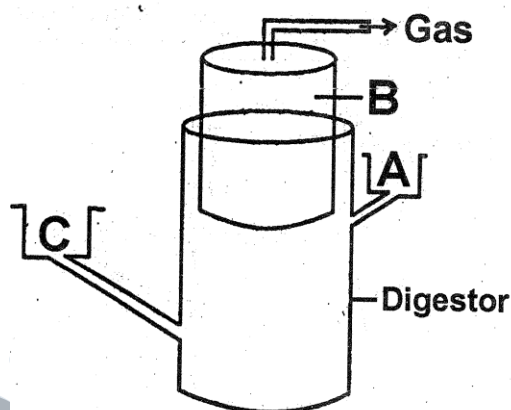
18. Which of the following bacteria help in nitrogen fixation from atmosphere?

- A. *Azotobacter* B. *Rhizobium* C. *Azospirillum* D. *Lactobacillus*
(a) A, C, D (b) A, B, C, D (c) B, C, D (d) A, B, C

19. Methanogens grow anaerobically on cellulosic material and produce

- A. methane B. oxygen C. carbon dioxide D. hydrogen
(a) A, C,D (b)A,B, C, D (c) B, C, D (d)A, B
20. First hormone produced artificially by culturing bacteria is-
(a) Insulin (b) Thyroxine (c) Testosterone (d) Adrenaline
21. Methanogens are found in
A. ethanol B. organic acids C. anaerobic sludge D. rumen of cattle
(a) A,C, D (b) C,D (c) B, C, D (d)A,B
22. *Streptomyces ramosus* is the source of the antibiotic -
(a) erythromycin (b) chloromycetin (c) aureomycin (d) terramycin
23. Statins used for lowering blood-cholesterol level are extracted from -
(a) algae (b) bacteria (c) virus (d) Yeast
24. The solids which settle after primary treatment of sewage are called
(a) primary sludge (b) activated sludge (c) flocs (d) total solids
25. Cyclosporin A is produced from -
(a) *Trichoderma polysporum* (a fungus) (b) *Bacillus* (a bacterium)
(c) *Aspergillus* (a fungus) (d) all of these
26. Which of the following is used in preparing cheese?
(a) algae (b) viruses (c) microbes (d)prions
27. Which of the following organisms is used in the production of beverages?
(a) *Penicillium notatum* (b) *Saccharomyces cerevisiae* (c) *Aspergillus niger* (d) *Clostridium butylicum*
28. Acetic acid is produced by a
(a) fungus (b) bacterium (c) Yeast (d) virus
29. Which of the following bacteria convert milk into curd?
(a) *Propioni bacterium* (b) *Lactobacillus* (c) *Streptococcus* (d) *Bacillus*
30. Biogas contains -
(a) CO₂ (b)H₂S (c)CH₄ (d) all of these
31. Streptomycin is produced from -
(a) *Streptomyces coelicolor* (b) *Streptomyces griseus* (c) *Streptomyces fradiae* (d) *Streptomyces venezuelae*
32. The primary treatment of sewage involves -
(a) digestion (b) decomposition
(c) sedimentation and filtration (d) none of these
33. The chemical substances produced by some microbes which can kill or retard the growth of other microbes are called -
(a) toddy (b) lactic acid (c) antibiotics (d) ethanol
34. Which of the following serve as biofertilizer in paddy fields?
(a) Bacteria (b) Yeast
(c) Cyanobacteria. (blue-green algae) (d) Fungi
35. Which of the following bacteria has a role in removing clots from our blood vessels?
(a) *Bacillus thuringiensis* (b) *Clostridium butylicum* (c) *Streptococcus* (d) *Lactobacillus*

36. The dough used for making bread is fermented by
 (a) bacteria (b) Yeast (c) C^{f} (d) algae
37. Microbes are found -
 (a) in soil (b) in air (c) in water (d) everywhere
 (d) A - Rum; B - *Aspergillus niger*, *Mucor*, C - Ectomycorrhiza
38. The below diagram shows a typical biogas plant. Which of the following four option, products labelled as A, B and C are correctly identified-



- (a) A - Sludge; B - Methane, Oxygen; C - Dung/water
 (b) A- Sludge; B - Methane, Carbon dioxide; C - Dung, water
 (c) A- Sludge; B- Ethylin, Carbon dioxide; C - Dung, water
 (d) A- Sludge; B - Methane, Carbon dioxide; C - Sewage
39. Given below are three statements (A-B) each with one or more blanks. Select the option which correctly fills the blanks in the statements -

Statements:

A Microbes consume the major part of the organic matter in the effluent and reduce _____ of sewage.

B. Certain bacteria which grow anaerobically on cellulosic material, produce large amount of methane along with CO_2 and H_2 . The bacteria are commonly called as _____ and one such common bacterium is _____.

Options:

- (a) A - CO_2 demand; B - *methanogens*, *Methanobacterium*
 (b) A- Carbon; B -*methanogens*, *Methanobacterium*
 (c) A - *biochemical oxygen demand*; B - *methanogens*, *Methanobacterium*
 (d) A - *biochemical oxygen demand*; B - *Methylokorus inferorum*
40. Given below are three statements (A-B) each with one or more blanks. Select the option which correctly fills blanks in the statements -**Statements:**
- A. Statins produced by the yeast, _____
- B. _____ contains insecticidalcrystal proteins thurioside, which is stomach poison and highly insect specific.
- Options:**
- (a) A - *Monascus purpureus*; B - *Bacillus thuringiensis*
 (b)A-*Leuconostoccitrovorum*;B-*Mucorpusi1lus*

(c) A - *Streptococcus thermophilus*; B - *Lactobacillus bulgaricus*

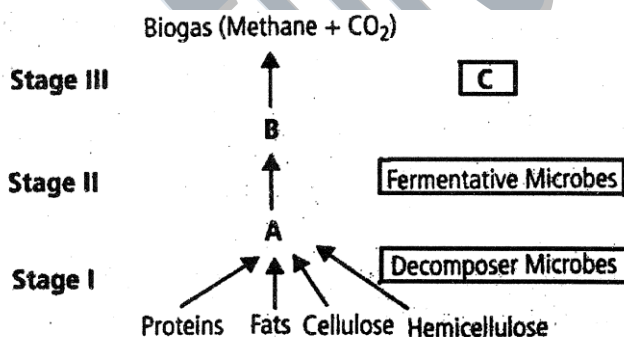
(d) A - *Hordeum vulgare*; B - *Humulus lupulus*

41. **Column I**
 I. Statins
 II. Ethanol
 III. Dung
 IV. Bt-cotton
- Column II**
 A. Yeast
 B. Blood-cholesterol lowering agent
 C. Insect-resistant plant
 D. Biogas

Which of the combinations is correct?

- | | I | II | III | IV |
|-----|---|----|-----|----|
| (a) | B | A | D | C |
| (b) | C | D | A | B |
| (c) | D | C | A | B |
| (d) | D | B | A | C |

42. Refer the given flow chart of biogas production. In which of the following options, correct word for all the Stage I, Stage II, Stage III, C are identified -



- | | Stage I | Stage II | Stage III | C |
|-----|----------------|----------------|----------------|----------------------|
| (a) | Solubilisation | Acidogenesis | Methanogenesis | Methanogens |
| (b) | Acidogenesis | Solubilisation | Methanogenesis | Methanogens |
| (c) | Solubilisation | Acidogenesis | Methanogenesis | <i>Lactobacillus</i> |

43. Benefits of mycorrhizae are -
- A. Resistance to root-borne pathogens
 B. Tolerance to salinity and absorption of phosphorus
 C. Tolerance to drought
 D. Overall increase in the plant growth and development
- (a) Only A, B (b) Only B, C (c) Only C, D (d) A, B, C, D
44. Antibiotics are used to treat diseases like -
- (a) Plague (b) Whooping cough, Diphtheria
 (c) Leprosy (d) All
45. Consider the following statements (A-D) about organic farming :
- (A) Utilizes genetically modified crops like Bt cotton (B) Uses only naturally produced inputs like compost
 (C) Does not use pesticides and urea (D) Produces vegetables rich in vitamins and minerals
- Which of the above statements are correct?
- (a) B, C and D (b) C and D only (c) B and C only (d) A and B only
46. I. All cyanobacteria are N₂-fixers
 II. The main sources of biofertilizers are bacteria, fungi and cyanobacteria
 III. *Azospirillum* and *Azotobacter* are symbiotic N₂-fixers.
 IV. Microbes like bacteria and many fungi can be grown on nutritive media to form colonies but they cannot be

seen with the naked eyes.

(a) All are correct

(b) All are wrong

(c) Only I, III and IV are wrong

(d) Only II is wrong

47. Which of the following statements about mycorrhizae is false?

I. In ectomycorrhizae, association between the fungus and plant is less intimate than in endomycorrhizae

II. The mycorrhizal association of fungus and the plant may have had importance in the evolution of land plant

III. The mycorrhizal association is a mutualistic symbiosis

IV. Fungal partner is associated with the only roots of the higher plants (like angiosperms)

V. Only advanced modern plants such as angiosperms possess mycorrhizae

(a) Only V

(b) Only IV

(c) Only I and III

(d) Only II and V

48. Which of the following is correct?

I. Wine and beer are produced without distillation of fermented broth

II. Wine and beer are produced with distillation of fermented broth

III. Whisky brand and rum are produced by distillation of fermented broth

IV. Whisky brand and rum are produced without distillation of fermented broth

(a) I and IV

(b) I and III

(c) II and V

(d) II and III

49. Choose the correct sequence of microbes involved in biogas production -

(a) Fragmentative microbes, decomposers, methanogens

(b) Decomposers, methanogens, putrefying microbes

(c) Putrefying microbes, methanogens, saprophytic microbes

(d) Decomposers, fermentative microbes, methanogens

50. The reason that the chemical / synthetic fertilizers should be replaced by biofertilizers is that the former -

(a) Are source of environmental pollution

(b) Are expensive

(c) Exhaust the valuable energy resources for their manufacture

(d) All

51. Which of the following statements is correct?

A. Single cell protein is rich in high quality proteins but poor in fat.

B. BOD is the amount of oxygen that would be consumed if all the inorganic matter in one litre of water were oxidised by bacteria.

C. *Trichoderma sp* are free living fungi that are effective biocontrol agents of several pathogens.

D. Baculoviruses are pathogens that attack insects and other arthropods.

E. *Bacillus thuringiensis* is first used biopesticide.

F. Lactase enzyme is used in alcoholic fermentation.

G. Mycorrhiza is a symbiotic association between fungi e.g. *Glomus* and vascular plant.

(a) B, C, F, G

(b) A, D, F

(c) A, C, D, E, G

(d) B, F

52. In cheese manufacture, the micro-organisms are used for-

(a) the souring of milk only

(b) the ripening only

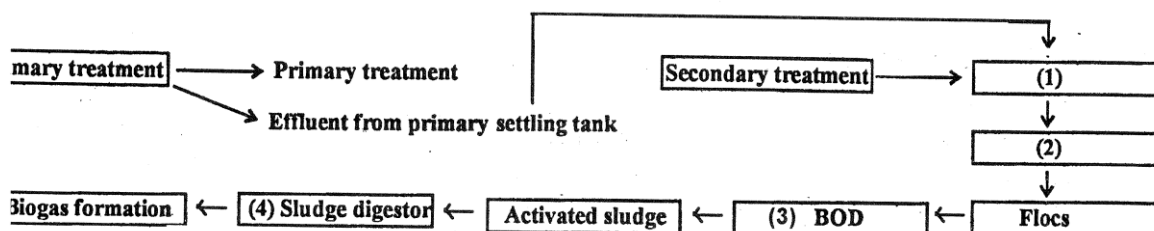
(c) development of resistance to spoilage

(d) Both a and b

53. Which one(s) is/are correct about Cyclosporin A?

- (a) It is produced by the fungus *Trichoderma polysporum*
 (b) It is used as an immuno suppressive agent during organ transplantation
 (c) It is produced by a type of yeast, *Monascus purpureus*
 (d) Both a and b

54. Following is the sewage treatment. In which of the following options, correct word for all the four numbers (1,2,3 and 4) are indicated -



- (a) 1 - Large aeration tanks; 2 - Chemically agitation; 3 - High; 4 -Anaerobic
 (b) 1 - Large aeration tanks; 2 - Mechanically agitation; 3 - Low; 4 -Anaerobic
 (c) 1 - Large aeration tanks; 2 - Mechanically agitation; 3 - Low; 4 -Aerobic
 (d) 1 - Large aeration tanks; 2 - Mechanically agitation; 3 - High; 4 -Anaerobic

55. Column I
 I. *Saccharomyces*
 II. *Trichoderma*
 III. *Lactobacillus*
 IV. *Nostoc*

Column II
 A. Bacteria
 B. Cyanobacteria
 C. Fungi
 D. Yeast

Which of the combinations is correct?

- | | I | II | III | IV |
|-----|---|----|-----|----|
| (a) | B | A | D | C |
| (b) | C | D | A | B |
| (c) | D | C | A | B |
| (d) | D | B | A | C |

56. Given below are three statements (A-C) each with or\or more blanks. Select the option which correctly fills the blanks in the statements -

Statements:

- A. _____ a traditional drink of some parts of South India is made by fermenting sap from palms.
 B. Citric acid is obtained through the fermentation carried out by _____ and _____ on sugary syrups.
 C. In _____ the fungus forms a mantle on the surface of the roots.

Options:

- (a) A - Toddy; B - *Aspergillus niger*, *Mucor*, C - Ectomycorrhiza
 (b) A - Wine; B - *Aspergillus niger*, *Mucor*, C - Ectomycorrhiza
 (c) A - Beer; B - *Aspergillus niger*, *Mucor*, C - Ectomycorrhiza

57. Given below are two statements (A-B) each with one or more blanks. Select the option which correctly fills the blanks in the statements-

Statements:

- A. Terramycin is an antibiotic isolated from _____ and interfere with the _____ of disease causing bacteria.
 B. Microorganisms (e.g., bacteria, yeast, filamentous fungi, algae, etc), that can be cultured on a commercial scale in fermenter and used as a food source or as animal feed are called _____

Options:

- (a) A - Amanita, protein synthesis; B - single cell protein (SCP)

- (b) A - *Penicillium*, protein synthesis; B - *single cell protein (SCP)*
 (c) A - *Morchella*, protein synthesis; B - *single cell protein (SCP)*
 (d) A - *Streptomyces rimosus*, protein synthesis; B - *single cell protein (SCP)*
58. The organisms which are used to enrich the nutrient quality of the soil are called -
 (a) mycorrhiza (b) biofertilizers (c) Yeast (d) methanogens
59. Which of the following antibiotics was discovered first?
 (a) Streptomycin (b) Neomycin (c) Erythromycin (d) Penicillin
60. Citric acid is produced by -
 (a) *Acetobacter acetii* (a bacterium) (b) Yeast (a fungus)
 (c) *Aspergillus niger* (a fungus) (d) *Streptococcus* (a bacterium)
61. The bioactive molecule cyclosporin. A is used in -
 (a) whooping cough (b) diphtheria (c) leprosy (d) organ-transplant patients
62. The nutritive media for growing bacteria and other microorganisms in the laboratory is called -
 (a) colonies (b) culture media (c) baking media (d) fermentation
63. The mixture of gases released during anaerobic digestion of sludge is called
 (a) methane (b) carbon dioxide (c) biogas (d) flammable gases
64. Which one of the following sets includes bacterial diseases?
 (a) Tetanus, tuberculosis, measles (b) Diphtheria, leprosy, plague
 (c) Cholera, typhoid, mumps (d) Malaria, mumps, poliomyelitis
65. Given below are three statements (A-B) each with one or more blanks. Select the option which correctly fills the blanks in the statements –
- Statements:**
- A. The dough which is used to prepare idli and dosa is fermented by _____ and _____. The puffy appearance of dough is due to the release of _____ by these microorganisms.
- B. Microbes are also used in commercial production of certain organic acids. Butyric acid is produced by _____ and lactic acid is produced by _____.
- Options:**
- (a) A - *Streptococcus faec s*, *Pedicoccus cerevisiae*, CO₂; B - *Clostridium butylicum*, *Lactobacillus*
 (b) A - *Agaricus faec s*, *Pedicoccus cerevisiae*, O₂; B - *Clostridium butylicum*, *Lactobacillus*
 (c) A - *Streptococcus faec s*, *Pedicoccus cerevisiae*, CO₂; B - *Bacillus*, *Lactobacillus*
 (d) A - *Streptococcus faec s*, *Spirulina*, CO₂; B - *Clostridium butylicum*, *Lactobacillus*
66. The gas responsible for puffing-up appearance of dough comes from -
 (a) aerobic respiration (b) fermentation (c) photosynthesis (d) photorespiration
67. The bacterium that commonly lives in animal and human intestines is -
 (a) *Bacillus anthracis* (b) *Vibrio cholerae* (c) *Escherichia coli* (d) *Corynebacterium*
68. The symbiotic association between fungi and roots of higher plants is called -
 (a) lichen (b) mycorrhiza (c) biofertilizer (d) BOD
69. During which stage of sewage treatment microbes are used?
 (a) Primary treatment (b) Secondary treatment (c) Tertiary treatment (d) All of these
70. The microscopic proteinaceous infectious agents are called -
 (a) protozoa (b) fungi (c) prions (d) bacteria

71. Given below are three statements (A-B) each with one or more blanks. Select the option which correctly fills the blanks in the statements-

Statements:

- A. Bioactive molecule, _____ is used as immunosuppressive agent in organ transplant patients, It is produced by the fungus _____.
- B. Primary treatment of sewage involves physical removal of small and large particles through _____.

Options:

- (a) A -Antibiotic, *Trichoderma polysporum*; B -filtration and sedimentation
- (b) A - Cyclosporin A, *Trichoderma polysporum*; B - filtration and sedimentation
- (c) A - Cyclosporin A, *Trichoderma polysporum*; B - Centrifugation and sedimentation
- (d) A-Antibiotic, *Trichoderma polysporum*; B - Centrifugation and sedimentation

73. Column I

- I. Methanogens
II. Organic wastes
III. *Bacillus thuringiensis*
IV. *Peudiiiuni noisium*

Column II

- A. Microbial biocontrol agent
B. Penicillin
C. Biochemical oxygen demand
D. *MethsnobactGrium*

Which of the combinations is correct?

- | | I | II | III | IV |
|-----|---|----|-----|----|
| (a) | B | A | D | C |
| (b) | C | D | A | B |
| (c) | D | C | A | B |
| (d) | D | B | A | C |

74. Which one is false?

- I. Cyanobacteria are autotrophic microbes widely distributed in aquatic and terrestrial environments.
- II. *Anabaena*, *Nostoc* and *Oscillatoria* are photosynthetic oxygenic N₂ fixers
- III. *Tolypothrix* (BGA) can increase rice production by about 20%.
- IV. BGA add organic matter to the soil and increase its fertility.
- V. In our country biofertilizers are not available commercially in the markets for farmers.

- (a) Only V (b) Only IV (c) Only III (d) None

75. Column I

- I. Fermentors
II. Bread
III. Aerobic microbes
IV Ganga Action Plan

Column II

- A. Baker's yeast
B. Large vessels for growing microbes
C. Ministry of Environment and Forest
D. Floes

Which of the combinations is correct?

- | | I | II | III | IV |
|-----|---|----|-----|----|
| (a) | B | A | D | C |
| (b) | C | D | A | B |
| (c) | D | C | A | B |
| (d) | D | B | A | C |

76. Column I
 I. *Aspergillus niger*
 II. *Lactobacillus*
 III. *Clostridium butylicum*
 IV. *Trichoderma polysporum*
 Which of the combinations is correct?
- | | I | II | III | IV |
|-----|---|----|-----|----|
| (a) | B | A | D | C |
| (b) | C | A | B | D |
| (c) | A | «B | C | D |
| (d) | D | B | A | C |
77. Which one of the following is an example of carrying out biological control of pests/diseases using microbes?
 (a) *Trichoderma* sp. against certain plant pathogens (b) Nucleopolyhedrovirus against white rust in Brassica
 (c) Bt - cotton to increase cotton yield (d) Lady bird beetle against aphids in mustard
78. Consider the following four statements (a-d) and select the option which includes all the correct ones only.
 (A) Single cell *Spirulina* can produce large quantities of food rich in protein, minerals, vitamins etc.
 (B) Body weight-wise the microorganism *Methylophilus methylotrophus* may be able to produce several times more proteins than the cows per day
 (C) Common button mushrooms are a very rich source of vitamin C
 (D) A rice variety has been developed which is very rich in calcium.
 Options :
 (a) Statements (C), (D) (b) Statements (A), (C) and (D)
 (c) Statements (B), (C) and (D) (d) Statements (A), (B)
79. The pathogen *Microsporum* responsible for ringworm disease in humans belongs to the same Kingdom of organisms as that of
 (a) *Rhizopus*, a mould (b) *Ascaris*, a round worm
 (c) *Taenia*, a tapeworm (d) *Wuchereria*, a filarial worm
80. The most abundant prokaryotes helpful to humans in making curd from milk and in production of antibiotics are the ones categorised as:
 (a) Cyanobacteria (b) Archaeobacteria
 (c) Chemosynthetic autotrophs (d) Heterotrophic bacteria
81. Column I
 I. *Streptomyces* A. Nitrogen fixation
 II. *Rhizobium* B. Source of antibiotics
 III. *Nitrosomonas* C. Vinegar synthesis
 IV. *Acetobacter* D. Nitrification
 Which of the combinations is correct?
- | | I | II | III | IV |
|-----|---|----|-----|----|
| (a) | B | A | D | C |
| (b) | C | D | A | B |
| (c) | A | B | C | D |
| (d) | D | B | A | C |
82. Yeast is used in the production of
 (a) Citric acid and lactic acid (b) Lipase and pectinase
 (c) Bread and beer (d) Cheese and butter
83. In gobar gas, the maximum amount is that of:
 (a) Butane (b) Methane (c) Propane (d) Carbon dioxide
84. In paddy field which of the following serves as an important biofertilizer.
 (a) B.G.A (b) *Rhizobium* (c) *Glomus* (d) *Azadirachta*
85. *Monascus purpureus* is a yeast used commercially in the production of:
 (a) ethanol
 (b) streptokinase for removing clots from the blood vessels,
 (c) Citric acid
 (d) blood cholesterol lowering statins

86. Ethanol is commercially produced through a particular species of
 (a) *Aspergillus* (b) *Saccharomyces* (c) *Clostridium* (d) *Trichoderma*
87. Which one of the following helps in absorption of phosphorus from soil by plants?
 (a) *Anabaena* (b) *Glomus* (c) *Rhizobium* (d) *Frankia*
88. Which one single organism or the pair of organisms is correctly assigned to its or their named taxonomic group
 (a) Paramecium and Plasmodium belong to the same kingdom as that of Penicillium
 (b) Lichen is a composite organism formed from the symbiotic association of an algae and a protozoan
 (c) yeast used in making bread and beer is a fungus
 (d) Nostoc and Anabaena are examples of protista
89. An organism used as biofertilizer for raising soybean crop is
 (a) *Azotobacter* (b) *Azospirillum* (c) *Rhizobium* (d) *Frankia*
90. Usnic acid in an antibiotic obtained from-
 (a) Fungi (b) Bacteria (c) Lichens (d) Algal
91. For retting of jute, the fermenting microbe is-
 (a) Methanophilic bacteria (b) Butyric acid bacteria (c) *Helicobacter pylori* (d) *Streptococcus lactis*
92. A nitrogen-fixing microbe associated with Azolla in rice fields is :
 (a) *Spirulina* (b) *Anabaena* (c) *Frankia* (d) *Tolypothrix*
93. Which one of the following microbes forms symbiotic association with plants and helps them in their nutrition
 (a) *Azotobacter* (b) *Aspergillus* (c) *Glomus* (d) *Trichoderma*
94. Which of the following is mainly produced by the activity of anaerobic bacteria on sewage?
 (a) Marsh gas (b) Laughing gas (c) Propane (d) Mustard gas
95. Which one of the following is not a biofertilizer?
 (a) Mycorrhiza (b) *Agrobacterium* (c) *Rhizobium* (d) *Nostoc*
96. Nitrogen fixation is-
 (a) $N_2 \rightarrow NH_3$ (b) $N_2 \rightarrow NO_3$ (c) $N_2 \rightarrow Ammonia$ (d) Both (a) and (b)
97. Rennin used is chosen in which industry in-
 (a) Antibiotic (b) Alkaloid (c) Enzyme (d) Inhibitor
98. A patient brought to a hospital with myocardial infarction is normally immediately given :
 (a) Penicillin (b) Streptokinase (c) Cyclosporin-A (d) Statins
99. The most common substrate used in distilleries for the production of ethanol is
 (a) Molasses (b) Corn meal (c) Soya meal (d) Ground gram
100. Select the correct statement -
 (a) Supply of O_2 to the biogas plant will have negative effect
 (b) Starch in cereals as raw material is used in fermentation process of making beer
 (c) Distillation of wine is necessary as it prevents further fermentation and spoiling wine
 (d) All
101. Which of the following enzymes is not used in making detergent?
 (a) Peptidase (b) Cellulase (c) Amylase (d) Lipase
102. Which of the following is false?
 (a) VAM is a biofertilizer (b) *Azolla* and BGA are the best biofertilizers

- (c) Synthetic fertilizers do not cause pollution (d) Probiotics are live microbial food supplement
103. Types of alcoholic beverages obtained depend on -
 (a) Raw materials used for fermentation (b) Types of processing
 (c) Both (d) Type of storage pattern
104. *Baculoviruses(Nucleopolyhedrovirus)* does not show
 (a) Host specificity (b) Narrow spectrum applications
 (c) Effects on non-target pathogens (d) Utility in IPM programme
105. The advantage the fungi derive from mycorrhizal association with plants -
 (a) Shelter + Nutrients (b) Water from soil (c) Minerals from soil (d) Tolerance to salinity
106. Mycorrhiza is found in -
 (a) Oligotrophic soil deficient in nutrients (b) Eutrophic soil rich in nutrients
 (c) Oligotrophic soil rich in humus (d) Eutrophic soil deficient in nutrients
107. Enzyme which has the fibrinolytic effect is -
 (a) Protease (b) Amylase (c) Lipase (d) Streptokinase
108. Which of the following is common to *Azospirillum*, *Azotobacter*, *Anabaena*, *Nostoc* and *Oscillatoria* -
 (a) Prokaryotes (b) N₂-fixers (c) Both (d) Eukaryotes
109. Which antibiotic was extensively used to treat American soldiers wounded in World War II?
 (a) Terramycin (b) Erythromycin (c) Chloromycetin. (d) Penicillin

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	a	d	d	d	c	a	a	a	b	c	a	b	b	c	a	a	d	d	a	a
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	b	d	d	a	a	c	b	b	b	d	b	c	c	c	c	b	d	b	c	a
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	a	a	d	a	c	c	a	b	d	d	c	d	d	b	a	a	d	b	d	d
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	d	b	c	b	a	b	c	b	b	c	b	c	a	d	d	b	a	d	a	d
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	a	c	b	a	d	b	b	c	d	c	b	b	c	a	b	d	c	b	a	a
Ques.	101	102	103	104	105	106	107	108	109											
Ans.	b	c	c	c	a	a	d	c	d											

1. The construction of the first recombinant DNA was done by using the native plasmid of-
 - (a) E. Coli
 - (b) Salmonella typhimurium
 - (c) B.Thuringiensis
 - (d) Yeast
2. Restriction endonucleases:
 - (a) Cleave DNA at highly specific recognition sequences
 - (b) Are inserted into bacteria by bacteriophages
 - (c) Are made only by eukaryotic cells
 - (d) Add methyl groups to specific DNA sequences.
3. Plasmids :
 - (a) Are circular protein molecules
 - (b) Are required by bacteria
 - (c) Are tiny bacteria
 - (d) Confer resistance to antibiotics
4. Restriction enzymes are used in genetic engineering because:
 - (a) They can cut DNA at specific base sequence
 - (b) They are nuclease that can cut DNA at variable sites
 - (c) They can join different DNA fragments
 - (d) They are proteolytic enzymes which can degrade harmful proteins.
5. Polyethylene glycol method is used for-
 - (a) Biodiesel production
 - (b) Seedless fruit production
 - (c) Energy production from sewage
 - (d) Gene transfer without a vector.
6. Cay endo borins obtained from Bacillus thuringiensis are effective against
 - (a) Nematodes
 - (b) Boll worms
 - (c) Mosquitoes
 - (d) Flies
7. Which are among the following in fact a cloning plasmid and not an expression plasmid ?
 - (a) pBAD-18Cam
 - (b) pBCSK
 - (c) pUC18
 - (d) PET
8. Molecular scissors which cut DNA at specific site in-
 - (a) Pectinase
 - (b) Polymerase
 - (c) Restriction Endonuclease
 - (d) Ligase
9. Plasmids are-
 - (a) DNA
 - (b) Mitochondrial DNA
 - (c) Circular extra chromosomal DNA bacteria
 - (d) viral RNA
10. Identify the plasmid-
 - (a) Eco RI
 - (b) pBR322
 - (c) AluI
 - (d) Hind II
11. The structure involved in genetic engineering is:
 - (a) Plasmid
 - (b) Plastid
 - (c) Codon
 - (d) Anticodon.
12. Process by which we can add or delete certain gene is :
 - (a) Gene therapy
 - (b) Biotechnology
 - (c) Genetic engineering
 - (d) Cytogenetics.
13. Plasmid present in bacterial cells are :
 - (a) Circular double helical DNA molecules
 - (b) Linear double helical DNA molecules

14. (c) Circular double helical RNA molecules (d) Linear double helical RNA molecules.
Since DMA has a _____ charge, it moves towards the _____ electrode of the electrophoretic chamber
(a) positive (b) positive, negative (c) negative, positive (d) natural, neutral
15. Which is being synthesized by genetic engineering :
(a) Insulin (b) Renin (c) Thyroxine (d) Progesterone.
16. DMA finger printing is based on :
(a) Clones of DMA (b) DMA segments formed by RE enzymes
(c) Human efforts (d) Gene library.
17. What must be done before placing DNA into the electrophoretic chamber?
(a) It must be ground up with mortar and pestle (b) It must be cut by restriction endonucleases
(c) It must be treated with RNAase (d) None
18. In DNA fingerprinting:
(a) The variability of repeated sequences between two restriction sites is evaluated.
(b) Exonuclease enzyme digests/generate unique fragments
(c) Amplifies fewer DNA
(d) Protein is identified.
19. One of the key factors, which makes the plasmid the vector in genetic engineering is that-
(a) It is resistant to antibiotics (b) It is resistant to restriction enzymes
(c) Its ability to carry a foreign gene (d) Its ability to cause infection in the host
20. Transgenic plants are developed by-
(a) Clone and genetically modified genes (b) Introduction of foreign genes
(c) Genetic engineering (d) Purified genes
21. Fill up the blanks -
A. The construction of the first recombinant DNA emerged from the possibility of linking a gene encoding antibiotic resistance with a native _____ of _____.
B. Hind II always cut DNA molecules at a particular point by recognising a specific sequence of _____ base pairs. This specific sequence is known as _____ for Hind II.
C. The _____ in DNA is a sequence of base that reads same on the two strands when orientation of reading is kept the same.
D. _____, a pathogen of several dicot plants is able to deliver a piece of DNA known as _____ to transform normal plant cells into tumor cells.
(a) A - Plasmid, *Salmonella typhimurium*; B - Six, Recognition sequence, C - P ndrome, D - *Agrobacterium tumifaciens*, T-DNA
(b) A- Plasmid, *Salmonella typhimurium*; B - Seven, Recognition sequence, C - P ndrome, D - *Agrobacterium tumifaciens*, T-DNA
(c) A- Chromosome, *Salmonella typhimurium*; B - Six, Recognition sequence, G - P ndrome, D - *Agrobacterium tumifaciens*, T-DNA
(d) A - Plasmid, *Salmonella typhimurium*; B - Six, Recognition sequence, C - P ndrome, D - *Agrobacterium*

tumifaciens, Z-DNA

22. Fill up the blanks-

A. When cut by the same restriction enzyme, the resultant DNA fragments have the same kind of _____ and these can be joined together end-to-end using

B. Disruption of the cell membranes can be achieved by treating the bacterial cells plant or animal tissue with enzymes such as _____ (bacteria), _____ (plant cells) and _____ (fungus).

C. If any protein encoding gene is expressed in a heterologous host, it is called a _____.

D. In gel electrophoresis, the separated DNA fragments can be seen only after staining the DNA with a compound known as _____ followed by exposure to UV radiation.

(a) A- sticky ends, recombinase; B - lysozyme, cellulase, chitinase; C - recombinant protein; D - ethidium bromide

(b) A- sticky ends, DNA ligases; B - exonuclease, cellulase, chitinase; C - recombinant protein; D - ethidium bromide

(c) A- sticky ends, DNA ligases; B - lysozyme, cellulase, chitinase; C - native protein; D - cesium chloride

(d) A- sticky ends, DNA ligases; B - lysozyme, cellulase, chitinase; C - recombinant protein; D - ethidium bromide

23. Which of the following method can be used for making the bacterial cell 'competent'?

(a) Treating with specific concn. of divalent cation (Ca^{2+})

(b) Treating with specific concn. of monovalent cation (K^+)

(c) Heat shock

(d) Both (a) & (c)

24. Insertional inactivation is related to

(a) Microinjection

(b) Gene gun

(c) Gel electrophoresis

(d) Selection of recombinants

25. During gel electrophoresis for separation of DNA fragment

(a) Smallest fragment will move to the farthest point towards cathode

(b) Smallest fragment will move to the farthest point towards anode

(c) Largest fragment will move to the farthest point towards cathode

(d) Largest fragment will move to the farthest point towards anode

26. After completing the transformation experiment involving the coding sequence of enzyme α -galactosidase, the recombinant colonies should

(a) Give blue colour

(b) Not give blue colour

(c) Have active α -galactosidase

(d) Both (b) & (c)

27. Which of the following is the correct sequence of PCR or polymerase chain reaction?

(a) Denaturation \rightarrow Annealing \rightarrow Extension

(b) Extension \rightarrow Denaturation \rightarrow Annealing

(c) Annealing \rightarrow Extension \rightarrow Denaturation

(d) Denaturation \rightarrow Extension \rightarrow Annealing

28. Which of the following enzyme is used in case of fungus to cause release of DNA along with other macromolecules?

(a) Lysozyme

(b) Cellulase

(c) Chitinase

(d) Amylase

29. DNA fingerprinting is done by a technique called:

(a)ELISA (b) Northern blotting (c) Southern blotting (d)RIA.

30. X technique is now routinely used to detect HIV in suspected AIDS patients. It is being used to detect mutations in genes in suspected cancer patients too. It is a powerful technique to identify many other genetic disorders. Identify X-

(a)X = PCR (b)X = DMA fingerprinting (c) X = Bioinformatic (d) X = X-ray defraction

31. One of the following in tramgereic of organisms-

(a) Holly sheep and cotton Bt (b) Dolly sheep and cotton Bt
(c) Flaa save tomato and cotton Bt (d) Holly sheep and flove save tomato

32. When gerotype of an organism is improved by the addition of foreign genes the process sin called-

(a) Biotechnology (b) Tissue culture (c) Genetic engineering (d) Genetic diversity

33. Ligase in used for-

(a) Separating DNA (b) Joining two DNA fragments
(c) DNA polymerase reaction (d) All of these

34. Which of the following p ndromic sequence is recognised by EcoRI?

(a) $\begin{array}{c} 5' \downarrow \text{GAATTC} 3' \\ \text{CTTAAG} \uparrow 5' \end{array}$ (b) $\begin{array}{c} 5' \text{CCC} \downarrow \text{GGG} 3' \\ \text{GGG} \uparrow \text{CCC} 5' \end{array}$ (c) $\begin{array}{c} 5' \text{AGT} \downarrow \text{ACT} 3' \\ \text{TCA} \uparrow \text{TGA} 5' \end{array}$ (d) $\begin{array}{c} 5' \text{G} \downarrow \text{GATTC} 3' \\ \text{CCTAG} \uparrow \text{G} 5' \end{array}$

35. The most commonly used bioreactor is of stirring type. The stirrer facilitates

(a) Temperature control (b) pH control (c) Oxygen availability (d) Product removal

36. During isolation of DMA, addition of which of the following causes precipitation of purified DMA?

(a) Chilled ethanol (b) Ribonuclease enzyme (c) DMA polymerase (d) Proteases

37. During heat shock to the bacterium, the temperature used for giving thermal shock is

(a)82°C (b)100°C (c) Liquid nitrogen (d)42°C

38. Which of the following techniques can be used to introduce foreign DNA into cell?

(a) Using disarmed pathogen (b) Microinjection
(c) Gene gun (d) All of these

39. For transformation with recombinant DNA, the bacterial cells must first be made 'competent' which means

(a) Should increase their metabolic reactions
(b) Should decrease their metabolic reactions
(c) Increase efficiency with which DNA enters the bacterium
(d) Ability to divide fast

40. Which of the following is not applicable to *Agrobacterium tumifaciens*?

(a) Pathogen of several dicot plants
(b) Has ability to transform normal plant cells
(c) Delivers gene of our interest
(d) Ti plasmid of it is always pathogenic to plants without any exception

41. Which of the following has the ability to transform normal cells into cancerous cells in animals?

(a) *Agrobacterium tumefaciens* (b) Retroviruses

- (c) DNA-viruses (d) Plasmids
42. The procedure through which a piece of DNA is introduced in a host bacterium is called
(a) Cloning (b) Transformation (c) PCR (d) Clonal selection
43. The term humulin is associated with :
(a) Insulin hormone produced by transgenic *E. coli* (b) Lysosomal enzyme
(c) Isoenzymes of LDH (d) Antibiotic produced by transgenic *Penicillium*.
44. *ECORI* cleaves DNA at-
(a) G A A T T C (b) T A T A G C (c) A A g g T T (d) g A T A T C
45. Which enzymes are used to break the cell to release DNA?
(a) Lysozyme (b) Cellulase (c) Chitinase (d) All of these
46. T-DNA is found in
(a) *Saccharomyces* (b) *Agrobacterium* (c) *Penicillium* (d) *Puccinia*
47. The first restriction endonuclease reported was
(a) *Hind II* (b) *EcoRI* (c) *Hind III* (d) *BamHI*
48. Pairing of fragments derived from DNA is a process called
(a) Staggering (b) Annealing (c) Augmenting (d) Fragmenting
49. Identify the true statements -
A. The first recombinant DNA was constructed by using a piece of DNA from a plasmid carrying antibiotic resistance gene in the bacterium *Salmonella typhimurium* and linked it to the plasmid of *E. coli*.
B. Cohen and Boyer are known as father of genetic engineering.
C. When cut by the same restriction enzyme, the resultant DNA fragments have the same kind of sticky ends and these can be joined together using DNA ligase.
D. Endonucleases remove nucleotides from the ends of the DNA whereas exonucleases make cuts at specific positions within the DNA.
E. Presence of more than one recognition sites within the vector will generate several fragments, which will complicate the gene cloning.
F. Humulin was the first recombinant DNA, based product, produced and marketed in India.
G. YAC vectors contain the telomeric sequence, the centromere and autonomously replicating sequence from yeast chromosomes.
H. Alkaline phosphatase, is used to prevent unwanted self ligation of the vector DNA molecules in procedures of rDNA technology.
I. pBR322 vector was the first artificial ideal vector constructed by Boliver and Rodriguer.
J. Plasmid DNA is coated with histone proteins and can act as genetic factor.
(a) B, D, F, J (b) B, D, E, J (c) A, C, E, G, H, I (d) A, B, D, F, J
50. The controlled use of biological agents, such as microorganisms or cellular components, for beneficial use is called
(a) plant biology (b) biochemistry (c) biotechnology (d) molecular biology
51. Which one of the following restriction endonuclease is obtained from *Escherichia coli*?

- (a) BamH1 (b) Sma3A1 (c) Hind III (d) EcoRI
52. Autonomously replicating circular extrachromosomal DNA is called
(a) B-chromosome (b) jumping gene (c) plasmid (d) recombinant DNA
53. The tumour-inducing capacity of *Agrobacterium tumefaciens* is located in large extrachromosomal plasmids called
(a) Ri plasmids (b) plasmid pBR 322 (c) lambda phage (d) Ti plasmid
54. The experimental manipulation of DNA of different species, producing recombinant DNA is known as
(a) electroporesis (b) recombinant DNA technology
(c) transformation (d) somatic hybridization
55. Which of the following is used as cloning vehicle?
(a) Bacteriophage (b) Ti plasmid (c) Plasmid pBR 322 (d) All of these
56. Which enzyme is used as glue to join ends of DNA?
(a) EcoRI (b) Ligase (c) Cellulose (d) Pectinase
57. A bioreactor (fermenter) refers to
(a) a device in which substances are treated to stimulate biochemical-transformation by living cells
(b) a nuclear reactor for biological studies
(c) a tank for biochemical reactions
(d) organisms reacting to a stimulus
58. DNA fragments can be separated by a technique known as
(a) gel electrophoresis (b) gel digestion (c) transformation (d) microinjection
59. **Column I** **Column II**
I. Ti plasmid A. *Agrobacterium tumefaciens*
II. Sail B. Cancerous cells
III. Retroviruses C. Recombinant DNA
IV. Ligase D. Restriction enzyme
(a) I-D, II-A, III-B, IV-C
(b) I-B, II-A, III-D, IV-C
(c) I-D, II-A, III-C, IV-B
(d) I-B, II-A, III-D, IV-C
60. One bacterium which has found extensive use in genetic engineering work in plants is -
(a) *Xanthomonas citri* (b) *Bacillus coagulans*
(c) *Clostridium septium* (d) *Agrobacterium tumefaciens*
61. **Column I** **Column II**
I. Band A. Restriction fragments are attached to this
II. Positive pole B. Where specific restriction fragment collects in gel
III. Taq polymerase C. Piece of DNA cut up by restriction enzymes
IV. Recognition D. PCR
(a) I-D, II-A, III-B, IV-C
(b) I-A, II-D, III-B, IV-C
(c) I-D, II-A, III-C, IV-B
(d) I-B, II-A, III-D, IV-C
62. During DNA purification, which enzyme is used to treat plant cells?
(a) Lysozyme (b) Cellulose (c) Chitinase (d) Cutinase
63. In which country first artificial cultivation of mushroom started?

- (a) France (b) Italy (c) Australia (d) Germany
64. Which of the following has been used as cloning vector?
 (a) *Agrobacterium tumefaciens* (b) *Bacillus polymyxa*
 (c) *Aspergillus niger* (d) *Saccharomyces cerevisiae*
65. Which of the following are required to facilitate cloning into a vector?
 (a) Origin of replication (b) Selectable marker (c) Cloning sites (d) All of these
66. Taq DNA polymerase enzyme is obtained from
 (a) *Thermus aquaticus* (b) *Agrobacterium tumefaciens* (c) *Aspergillus flavus* (d) *Escherichia coli*
67. PCR stands for
 (a) polymerase chemical reaction (b) polymerase chain reaction
 (c) primary chain reaction (d) polymerase chain restriction
68. Which is incorrect?
 (a) In PCR two primers are used (b) Taq DNA polymerase is needed for PCR
 (c) Taq DNA polymerase is not thermostable (d) Multiple copies of gene can be synthesized in PCR
69. **Column I** **Column II**
 I. Recombinant DNA technology A. Vector
 II. Cloning vehicles B. Sequencing enzyme
 III. macromolecular separation C. Electrophoresis
 IV. DNA ligase D. Genetic engineering
 (a) I-D, II-A, III-B, IV-C (b) I-A, II-D, III-B, IV-C
 (c) I-D, II-A, III-C, IV-B (d) I-B, II-A, III-D, IV-C
70. If a protein encoding gene is expressed in a heterologous host it is called
 (a) recombinant protein (b) primary protein (c) secondary protein (d) tertiary protein
71. **Column I** **Column II**
 I. PCR A. Large scale culture
 II. Bioreactor B. To induce recombinant DNA in host cell
 III. Gene gun C. Restriction endonuclease
 IV. EcoRI D. Amplification of gene
 (a) I-D, II-A, III-B, IV-C (b) I-B, II-A, III-D, IV-C
 (c) I-D, II-A, III-C, IV-B (d) I-A, II-D, III-B, IV-C
72. Which is incorrect?
 (a) EcoRI cuts the DNA between bases G and A.
 (b) Each restriction endonuclease recognizes a specific palindromic nucleotide sequences in DNA.
 (c) When cut by same restriction enzyme, the resultant DNA fragments do not have the same kind of 'sticky-ends'.
 (d) Making multiple identical copies of any template DNA is called cloning.
73. **Column I** **Column II**
 I. Plasmid A. Selectable marker
 II. amp^r B. Extrachromosomal DNA

- (a) microneedles (b) micropipettes (c) microprojectiles (d) electrical impulses.
84. Due to ampicillin resistance gene, one is able to select a transformed cell in the presence of ampicillin. The ampicillin resistance gene in this case is called
 (a) recombinant gene (b) selectable marker (c) origin of replication (d) recognition site
85. **Column I**
 I. Agarose
 II. Opines
 III. Biolistic
 IV. Thermal cycler
 (a) I-D, II-A, III-B, IV-C
 (c) I-D, II-A, III-C, IV-B
- Column ii**
 A. PCR
 B. Gene gun
 C. Ti plasmid
 D. Sea weeds
 (b) I-D, II-C, III-B, IV-A
 (d) I-A, II-D, III-B, IV-C
86. Which of the following method(s) is/are used to introduce foreign DNA into host cells?
 (a) biolistics (b) electrophoresis (c) elution (d) DNA ligation
87. Which of the following vectors are used to deliver a desirable gene into animal and plant cells, respectively?
 (a) Ti plasmid and retroviruses (b) retroviruses and Ti plasmid
 (c) bacteriophage and pBR322 (d) pBR322 and bacteriophage
88. Which of the following is/are used in recombinant DNA technology?
 A. agarose gel B. ethidium bromide C. plasmid vector D. restriction endonuclease
 (a) A, B (b) B, C (c) C, D (d) A, B, C, D
89. **Column I**
 I. Cloning
 II. Molecular scissor
 III. Restriction endonuclease
 IV. T-DNA
 (a) I -D, II-A, III-B, IV-C
 (c) I-A, II-C, III-D, IV-B
- Column II**
 A. Making multiple identical copies
 B. Tumour
 C. Restriction enzymes
 D. Enzyme
 (b) I-B, II-A, III-D, IV-C
 (d) I-A, II-D, III-B, IV-C
90. Which statement is true about bioreactor?
 A. Bioreactor provides the optimal conditions for obtaining the desired product.
 B. Raw materials are biologically converted into specific products.
 C. A stirred-tank reactor is horizontal in shape.
 D. Large volume of cultures cannot be processed.
 (a) A, B (b) B, C (c) C, D (d) A, B, C, D
91. A. In elution the separated bands of DNA are cut out from agarose gel and extracted from the gel piece.
 B. λ cloning vector pBR 322 shows several restriction, *Or*, antibiotic resistance genes and *Rop*.
 C. The downstream processing and quality control testing vary from product to product.
 D. Competent bacterial cell cannot take up the plasmid.
 (a) All are correct (b) All are incorrect (c) Except D all are correct (d) Only D is correct
92. Which steps are involved in genetically modifying an organism?
 A. Identification of desirable DNA
 B. Insertion of DNA into the host
 C. Maintenance of introduced DNA in the host
 D. Isolation of recombinant protein
 (a) A, B (b) B, C (c) A, B, C (d) A, B, C, D
93. A. Large scale production involves use of bioreactors.
 B. Genetic engineering involves the use of restriction endonuclease, DNA ligase appropriate plasmid or viral vectors.

C. Modern biotechnology uses genetically modified organisms.

D. Bacterial cell wall is digested by lysozyme -

- (a) All are correct (b) All are incorrect (c) Only D is correct (d) A and B are correct

94. Which one is associated with *Agrobacterium tumefaciens*?

- A. Tumor B. Ti plasmid C. T-DNA D. Cancerous cells
(a) A, B (b) B, C (c) A, B, C (d) A, B, C, D

95. **Column I**

- I. PCR
II. Taq DNA polymerase
III. Extrachromosomal DNA
IV. Ethidium bromide
(a) I-C, II-A, III-B, IV-D
(c) I-D, II-A, III-C, IV-B

Column II

- A. *Thermus aquaticus*
B. Plasmid
C. Amplification
D. DNA staining
(b) I-B, II-A, III-D, IV-C
(d) I-A, II-D, III-B, IV-C

96. Which of the following is/are part(s) of biotechnology?

- A. in vitro fertilisation B. synthesis of a gene
C. correcting a defective gene D. developing a DNA vaccine
(a) A, B (b) B, C (c) C, D (d) A, B, C, D

97. Which statement is incorrect?

- A. Genetic engineering is also called recombinant DNA technology
B. Bacteriophage is not used as vector
C. MALAYALAM is a pandemic
D. Ethidium bromide can not be used for staining DNA
(a) A, B (b) B, D... (c) C, D (d) A, B, C, D

98. PCR needs-

- (a) 2 sets of primers (b) Taq polymerase
(c) Nucleotide as raw materials (d) All

99. Genetic engineering is-

- (a) Study of extranuclear genes (b) Plastic surgery
(c) Addition or removal of genes (d) Reconstruction surgery

100. Which of the following is not a tool used to perform genetic engineering -

- (a) plasmid (b) protein (c) gene gun (d) virus

101. After the formation of the product in the bioreactors, it undergoes through separation and purification process before a finished product is ready for marketing. These processes are collectively referred to as

- (a) upstream processing (b) downstream processing (c) elution (d) transformation

102. Molecular probes used for identification of recombinant clone carrying the desired DNA insert can be

- A. denatured double stranded DNA probes B. double stranded RNA probes
C. protein probes D. single stranded DNA probes,
(a) A, B (b) B, C (c) A, D (d) A, B, C, D

103. Which of the followings is / are concerned with biotechnology?

- (a) Biogas production (b) Sewage treatment (c) Biofertilizer (d) All of the above

104. Restriction endonucleases-

- A. are found in bacteria
B. are very useful in genetic engineering
C. cut the DNA at particular sites
D. are used naturally in a bacterial cell to defend against foreign DNA
(a) A, B (b) B, C (c) C, D (d) A, B, C, D

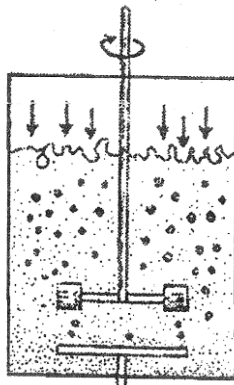
105. DNA recombinant technology uses -

- A. Restriction endonucleases B. DNA ligase

106. C. Cloning vector (a)A,B (b)B, C (c)C,D (d)A,B,C,D
Column I **Column II**
 I. Restriction enzyme A. Jumping gene
 II. Transposons B. Cloning vehicle
 III. Bacteriophage C. Hind III
 IV. P ndromes D. MALYALAM
 (a) I-C, II-A, III-B, IV-D (b) I-B, II-A, III-D, IV-C
 (c)I-D, II-A, III-C, IV-B (d)I-A, II-D, III-B, IV-C
107. **Column I** **Column II**
 I. EcoRI A. Bacillus amyloliquefaciens
 II. Bam HI B. Haemophilus influenza
 III. Hind III C. Escherichia coli
 IV. pBR 322 D. Artificial plasmid
 (a)I-C,II-A, III-B, IV-D (b) I-B, II-A, III-D, IV-C
 (c)I-D, II-A, III-C, IV-B (d)I-A, II-D, III-B, IV-C
108. First step in genetic engineering is-
 (a) Isolation of RNA (b) Isolation of protein
 (c) Purification of protein (d) Isolation of genetic material
109. The process of separation and purification of a biosynthetic product in called-
 (a) Downstream process (b) Biosynthetic process (c) Annealing process (d) Transformation process
110. The process of making many copies of a gene in called-
 (a) gene amplification (b) gene synthesis (c) gene cloning (d) All of these
111. In ECORI ECO stands for-
 (a) Eco friendly (b) E.Coli (c) Economic (d) Extra coenzyme
112. The first Transpoons were discovered in -
 (a) Yeast (b) Rice (c) Wheat (d) Corn
113. Which of the following in used an best genetic vector in plants-
 (a) Bacillus thuriengensis (b) Agrobacterium turnifaciens
 (c) Pseudomonas Puttida (d) All of these
114. Eukaryotic genes may not function properly when cloned into bacteria because of
 (a) inability to excise introns
 (b) destruction by native endonucleases
 (c) failure of promoter to be recognized by bacterial RNA polymerase
 (d) all of the above.
115. Which of the following tools of recombinant DNA technology is incorrectly paired with its use?
 (a) restriction enzyme-production of RFLPs
 (b) DNA ligase-enzyme that cuts DNA, creating the sticky ends of restriction fragments
 (c) DNA polymerase-used in a polymerase chain reaction to amplify sections of DNA
 (d) reverse transcriptase-production of cDNA from mRNA
116. Which of the following is a desirable characteristic for a cloning plasmid?
 (a) a site at which replication can be initiated

- (b) one or more unique restriction endonuclease sites
 (c) one or more antibiotic- resistance or drug resistance genes
 (d) all of the above
117. A mouse in which one particular gene has been replaced by its inactivated form generated in vitro is called -
 (a) transgenic mouse (b) knockout mouse (c) nude mouse (d) mutant mouse
118. Restriction-modification systems of bacteria exists to
 (a) protect bacteria from invading foreign DNA (b) promote conjugation
 (c) help the bacterial chromosome to replicate (d) encourage recombination of new genetic material
119. Restriction fragment length polymorphism (RFLP) is
 (a) the technique used to fingerprint patterns of inheritance
 (b) the difference in the restriction maps between the two alleles in a diploid cell
 (c) the difference in the restriction maps between two individuals of one species
 (d) the difference in the restriction maps between two individuals of two species
120. Which statement about restriction enzymes are false?
 (a) restriction enzymes cut DNA at specific sequence called recognition sites
 (b) a restriction enzyme always cut DNA to leave the same sequence at the ends
 (c) some restriction enzymes cut the two DNA strands at slightly different points within their recognition site to make a 'sticky' end
 (d) restriction enzymes are exonucleases rather than endonucleases
121. Terminal transferase is used
 (a) to add base at the 3' end of the DNA (b) to add base at the 5' end of the DNA
 (c) to carry out nick translation (d) to transfer phosphate at the 3' end of the DNA
122. A plant genetic engineer wishes to transfer and express a gene from sunflower into beans. Which of the following would be the vector of choice?
 (a) lambda phage (b) pBR322 plasmid (c) Ti plasmid (d) maize streak virus
123. *Agrobacterium tumefaciens* is an effective vector for use with
 (a) corn (b) rice (c) wheat (d) soyabean
124. Elution is a method applied for
 (a) Making the matrix during gel electrophoresis
 (b) Staining the bands of DNA after electrophoresis
 (c) Cutting out the pieces of agarose gel and extraction of DNA from gel pieces
 (d) Joining the specific DNA with the cloning vector
125. Restriction endonucleases are enzymes that -
 P. cleave the 5' terminal nucleotides from duplex DNA molecules
 Q. make sequence-specific cuts in both strands of duplex DNA molecules
 R. promote circularization of the duplex DNA molecule by removal of the 5' terminal nucleotides
 S. generate 3'-hydroxyl and 5'-phosphate ends in the cut DNA strands
 (a) P, Q (b) P, R (c) Q, S (d) P, Q, R, S

126. In recombinant DNA methods, the term vector refers to
 (a) the enzyme that cuts DNA into restriction fragments
 (b) the sticky end of a DNA fragment
 (c) a plasmid used to transfer DNA into a living cell
 (d) a DNA probe used to identify a particular gene
127. DNA of a bacterium is not cleaved by its own restriction enzymes because the recognition DNA sequences are
 (a) methylated (b) deleted
 (c) bound by inhibitory proteins (d) not accessible to restriction enzymes
128. The first nuclear transplant from an animal cell into an enucleated egg that produced a normal offspring was performed in-
 (a) sheep (b) frog (c) cat (d) dog
129. Which of the following is incorrect about reporter gene
 (a) gene whose phenotype can be assayed in a transformed organism
 (b) p-galactosidase gene is an example of reporter gene
 (c) test gene that is fused to the upstream region of the cloned gene
 (d) none
130. For a plasmid to be a cloning vector, the minimum numbers of elements required are
 (a) origin of replication, multiple cloning site, selection marker
 (b) origin of replication, multiple cloning site, selection marker, promoter
 (c) origin of replication, multiple cloning site, selection marker, translational start site
 (d) origin of replication, multiple cloning site, promoter
131. Most common reporter gene whose product can be directly visualized in transformed cells is
 (a) NPTII (Neomycin phosphotransferase) (b) CAT (chloramphenicol acetyl transferase)
 (c) Beta galactosidase (d) GFP (green fluorescent protein)
132. Restriction endonucleases hydrolyze polynucleotide from
 (a) only the 5' end (b) from either terminal
 (c) at an internal phosphodiester bond (d) a phosphodiester bond within a specific sequence
133. Identify the correct match for the given apparatus -

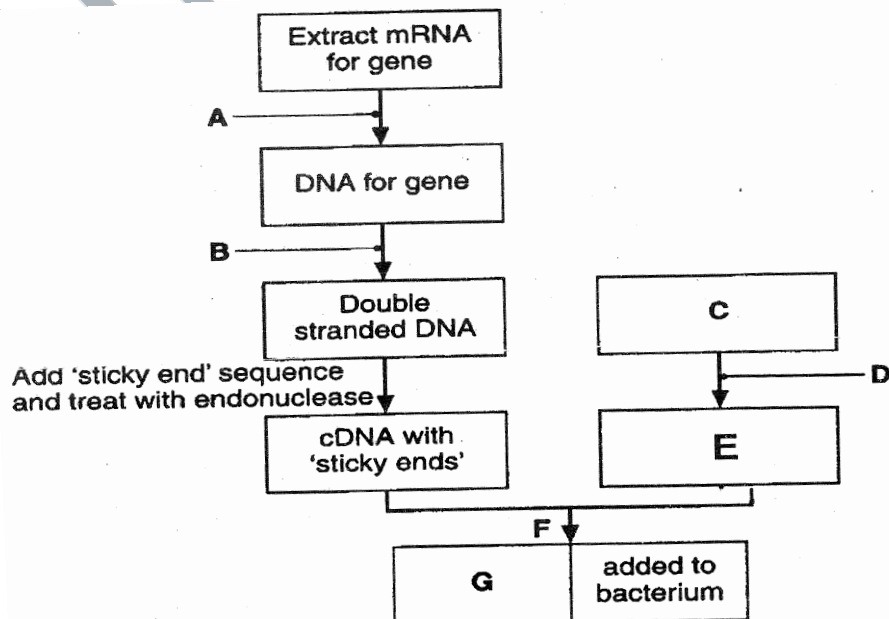


Apparatus

Function

	A	B	C	D
(a)	Hind I	EcoRI	amp ^R	ori
(b)	Hind I	BamHI	kan ^R	amp ^R
(c)	BamHI	Pst I	ori	amp ^R
(d)	EcoRI	BamHI	amp ^R	ori

141. Which statement correctly describes sequential steps in cDNA cloning?
- reverse transcription of mRNA, second strand synthesis, cDNA end modification, ligation to vector
 - mRNA preparation, cDNA synthesis using reverse transcription, second strand synthesis using terminal transferase, ligation to vector
 - mRNA synthesis using RNA polymerase, reverse transcription of mRNA, second strand synthesis, ligation to vector
 - double stranded cDNA synthesis, restriction enzyme digestion, addition of linkers, ligation to vector
142. pBR322 which is frequently used as a vector for cloning gene in E.coli is
- an original bacterial plasmid
 - a modified bacterial plasmid
 - a viral genome
 - a transposon
143. Shotgun approach is used for the construction of
- cDNA library
 - genomic library
 - both
 - none
144. Identify the labelled items A, B, C, D, E, F and G in the diagram below from the list I to VII given with -
- Components –**



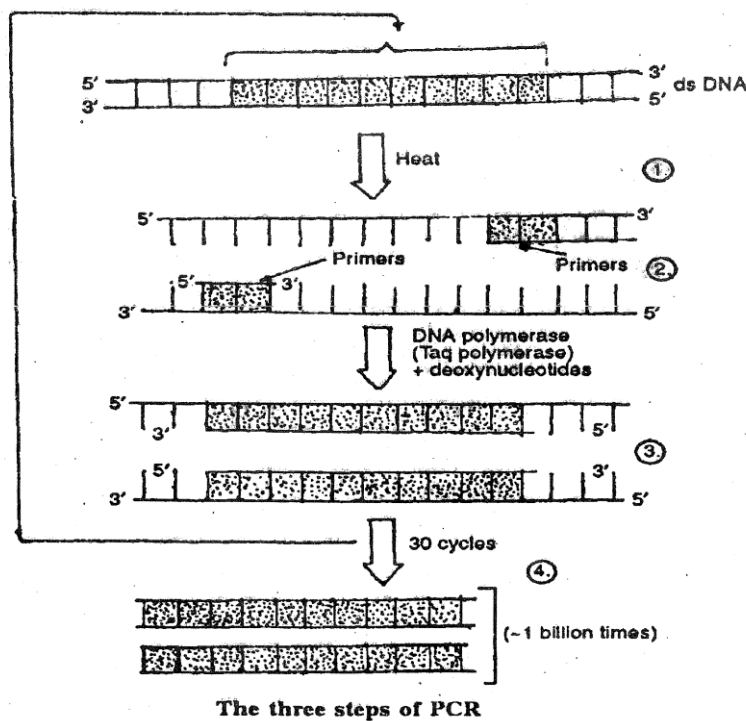
- DNA polymerase
- plasmid
- plasmid with 'sticky ends'

- IV. DNA ligase
- V. restriction endonuclease
- VI. recombinant DNA
- VII. reverse transcriptase

The correct components are -

	A	B	C	D	E	F	G
(a)	VII	I	II	V	III	IV	VI
(b)	VII	VI	V	IV	III	II	I
(c)	VII	V	III	I	II	IV	VI
(d)	I	II	IV	VI	III	V	VII

145. The below diagram refer to PCR. Identify the correct option -



- (a) 1 - Denaturation, 2 -Anne ng, 3 - Extension, 4 -Amplified
- (b) 1 -Anne ng, 2 -'Denaturation, 3 - Extension, 4 -Amplified
- (c) 1 - Denaturation, 2 -Anne ng, 3 -Amplified, 4 - Extension
- (d) 1 -Anne ng, 2 - Denaturation, 3 -Amplified, 4 - Extension

146. The enzymes responsible for restricting the growth of bacteriophage in '*Escherichia coil*' is

- (a) Added methyl group to protein. (b) Cut DNA in a particular fashion
(c) Added formyl group to DNA. (d) Both a and b

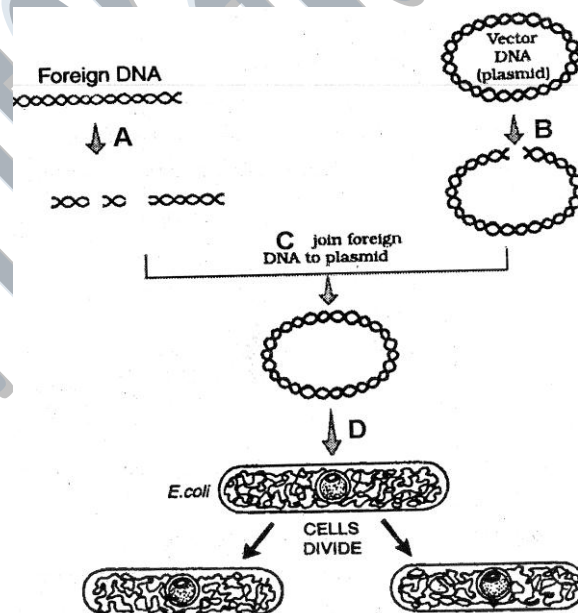
147. Which of the following is the part of biotechnology

- (a) Test-tube' baby (b) Developing a DNA vaccine
(c) Correcting a defective gene (d) All of these

148. Which of the following statement is not correct.

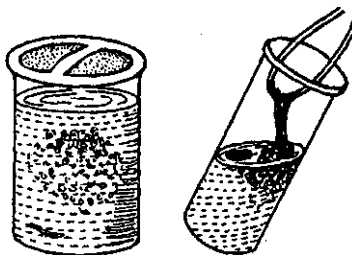
- (a) T-DNA transform normal plant cell into a tumor
(b) Retroviruses in animals have the ability to transform normal cell into cancerous cells
(c) Ti plasmids of *Agrobacterium tumefaciens* is modified into cloning vector which is more pathogenic to plants
(d) Retrovirus have also been disarmed and are now used to deliver desirable genes into animal cells

149.



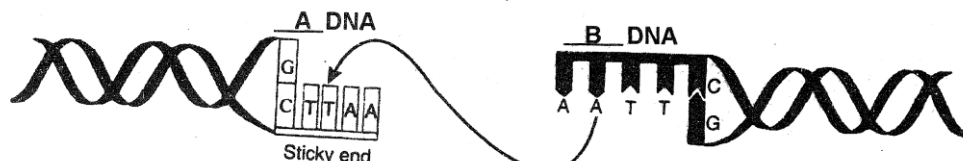
The above diagram refers to recombinant DNA technology. Identify A to D.

- | | A | B | C | D |
|-----|--------------------------|--------------------------|------------|----------------|
| (a) | Exonuclease | Endonuclease | DNA ligase | Transformation |
| (b) | Exonuclease | Exonuclease | DNA ligase | Transformation |
| (c) | Exonuclease | Endonuclease | Hydrolase | Transduction |
| (d) | Restriction Endonuclease | Restriction Endonuclease | DNA ligase | Transformation |
150. Purified DNA ultimately precipitates out after the addition of chilled ethanol. This can be seen as collection of fine threads in the suspension as seen in the figure. It refers to -



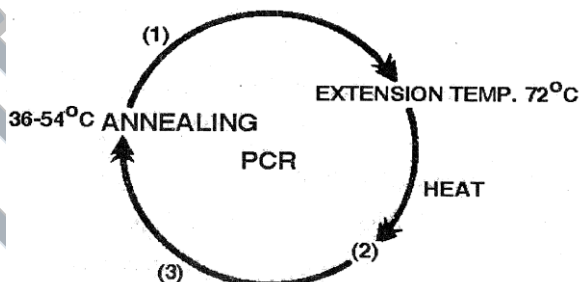
- (a) DNA Spooling (b) SNA digestion (c) DNA recognition (d) DNA bands

151. Go through the figure and select the option out of (a - d).



	A DNA	B DNA	Enzyme recognizing palindrome	Enzyme joining the sticky ends
(a)	Vector	Foreign	DAN ligase	EcoRI
(b)	Vector	Foreign	EcoRI	DAN ligase
(c)	Vector	Foreign	Exonuclease	DAN ligase
(d)	Vector	Foreign	DAN ligase	Exonuclease

152. Name the factors or steps indicated with numbers (3) -



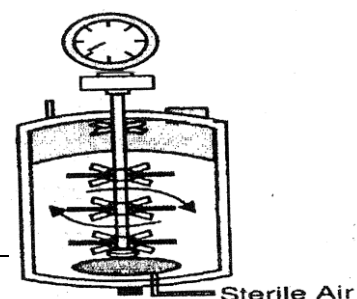
- (a) (i) Taq polymerase (ii) Denaturation at 94°C (iii) Primer
 (b) (i) Denaturation at 94°C (ii) Taq polymerase (iii) Primer
 (c) (i) Primer (ii) Denaturation at 94°C (iii) Taq polymerase
 (d) (i) taq polymerase (ii) Extension (iii) Ligation

153. Select the correct option which shows the most appropriate temperatures of three different steps of PCR mechanism

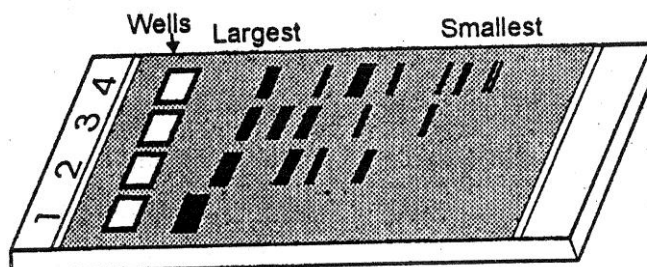
	Denaturation	Primer annealing	Primer extension
(a)	40 - 60°C	72°	90°
(b)	60 - 60°C	96°C	40 - 60°C
(c)	94 - 96°C	40 - 60°C	72°C
(d)	72°C	60 - 80°C	40 - 60°C

154. Identify the correct match for the given apparatus.

Apparatus	Function
(a) Gene gun	Vectorless direct gene transfer
(b) Column Chromatograph	Separation of chlorophyll pigments
(c) Stirred tank bioreactor	Carry out fermentation process
(d) Respirometer	Finding out rate of respiration



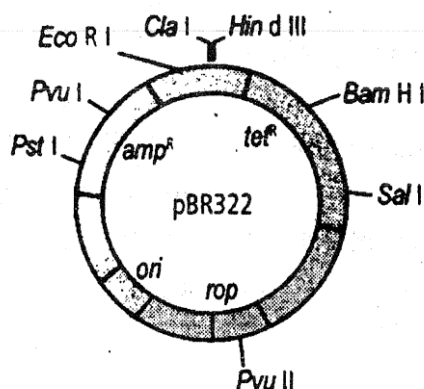
155. There is a restriction endonuclease called EcoRI. What does "co" part in it stand for?
 (a) coli (b) colon (c) coelom (d) coenzyme
156. Which of the following features cannot be associated with Ti plasmid of *Agrobacterium tumefaciens* which is modified into a cloning vector?
 (a) Able to deliver genes of our interest into a variety of plants
 (b) Modified into cloning vector as it can transfer a piece of T-DNA into the plant cells
 (c) Pathogenic, to the plants
 (d) Ti plasmid of *Agrobacterium* is a natural genetic engineer
157. Identify the correct match for the given figure.



- (a) Electrophoresis Differential migration of DNA fragments
 (b) Column Chromatograph Separation of chlorophyll pigments
 (c) Gene cloning Technique of obtaining identical copies of a particular DNA segment or a gene
 (d) Microinjection Technique of introducing foreign genes into a host cell.
158. Agarose extracted from sea weeds finds use in
 (a) Gel electrophoresis (b) Spectrophotometry (c) Tissue culture (d) PCR
159. Which of the following vectors is/are used for cloning in eukaryotic organisms?
 A. Plasmids
 B. Bacteriophages
 C. Ti plasmid of *Agrobacterium tumefaciens*
 D. Disarmed retroviruses
 (a) A, B, C and D (b) A and B only (c) C and D only (d) Only
160. *Agrobacterium tumefaciens*
 A. Acts as natural genetic engineer
 B. Carries *Vir* region which is essential for insertion of T-DNA into host cells
 C. Has been used to transfer genes for RNA interference¹ in plants
 Mark the correct statements
 (a) A only (b) A and B only (c) B and C only (d) A, B and C
161. Direct visual selection method for the selection of recombinant host cells on the basis of their inability to produce colour in the presence of chromogenic substrate can be applied if the vector used is a
 (a) Modified plasmid vector of *E. coli* (b) Modified bacteriophage
 (c) Modified *Agrobacterium tumefaciens* plasmid (d) Disarmed retrovirus
162. Two enzymes responsible for restricting the growth of bacteriophages in *Escherichia coli* were isolated. One was methylase and other was restriction endonuclease. What was the significance of methylase?
 (a) Able to cut the DNA of bacteriophage at specific sites
 (b) Able to remove the methyl group and hence prevent the action of restriction endonuclease on host DNA
 (c) Protection of host DNA from the action of restriction endonuclease by adding methyl group to one or two

- bases usually within the sequence recognized by restriction enzyme
- (d) Able to ligate the two cohesive ends of DNA molecule
163. The bacteria associated with plant genetic engineering are
 (a) *Salmonella* and *Pseudomonas* (b) *Salmonella typhimurium* and *Agrobacterium*
 (c) *Bacillus thuringiensis* and *Pseudomonas fluorescens* (d) Both b and c
164. After completion of biosynthetic stage, the product has to be subjected through a series of processes before it is ready for marketing as a finished product. This series of processes is called
 (a) Upstream processing (b) Downstream processing (c) Elution (d) Insertional inactivation
165. In Eco// cloning vector pBR 322. ROP codes for -
 (a) The proteins involved in the replication of the plasmid
 (b) The proteins involved in the antibiotic resistance
 (c) The proteins involved in the synthesis of antibiotic
 (d) All of these
166. In case of pBR-322, which of the following act as selectable markers?
 (a) amp^R (b) 'ori' site (c) tet^R (d) Both a and c
167. When a recombinant DNA is inserted within the coding sequence of an enzyme, B-galactosidase
 (a) This results into inactivation of the enzyme
 (b) This is called insertional inactivation
 (c) In the presence of insertion, the colonies do not produce any colour
 (d) All of these
168. Following enzymes /techniques are used in the process of recombinant DNA technology
 A. EcoRI to cut the isolated genome
 B. DNA ligase
 C. Protease and ribonuclease for removal of proteins and RNA from DNA
 D. Production of recombinant hosts
 E. Lysozyme for isolation of the genetic material (DNA)
 F. Gel electrophoresis for separation and isolation of DNA fragments
- Mark the correct sequence of their use
 (a) C, E, B, F, A, D (b) E, C, A, B, F, D (c) E, C, A, F, B, D (d) A, E, C, B, D, F
169. Selection of recombinants due to inactivation of antibiotics is a cumbersome procedure because
 (a) It requires plating of one plate having certain antibiotics
 (b) It requires plating of two plates having same antibiotics
 (c) It requires simultaneous plating on two plates having different antibiotics
 (d) None of these
170. If recombinant DNA is inserted within the coding sequence of enzyme galactosidase, which of the following will occur in case of non-recombinants?
 (a) Insertional inactivation. (b) Colonies do not produce any colour

- (c) Chromogenic substrate gives blue colour (d) Inactivation of enzyme galactosidase
171. Antibiotic resistance gene present of Bam HI site of a *E. coli* cloning vector is
 (a) Ampicillin resistance (b) Tetracycline resistance (c) Chloramphenicol resistance (d) Kanamycin resistance
172. The most common tool of genetic engineering
 (a) PBR 366 plasmid of *Escherichia coli* (b) M 13 plasmid of *Haemophilus aegyptius*
 (c) PBR 322 plasmid of *Escherichia coli* (d) PCR 238 plasmid of *Bacillus globigil*
173. Which of the following statement is not true.
 (a) Hind - II always cut DNA molecules at a particular point by recognising a specific sequence of 4 base pairs.
 (b) Besides Hind - II, today we know more than 900 restriction, enzymes.
 (c) The name ECO-RI comes from *Escherichia coli* -13.
 (d) Type - II restriction endonuclease is most useful in genetic engineering
174. Which of the following is not correctly matched for the organism and its cell wall degrading enzyme ?
 (a) Plant cells-Cellulase (b) Algae-Methylase (c) Fungi-Chitinase (d) Bacteria-Lysozyme
175. Amplification of gene of interest by using DNA polymerase may go upto
 (a) 0.1 million times (b) 1.0 million times (c) 1.0 billion times (d) 1.0 trillion times.
176. DNA fragments generated by the restriction endonucleases in a chemical reaction can be separated by-
 (a) Polymerase chain reaction (b) Electrophoresis
 (c) Restriction mapping (d) Centrifugation
177. For transformation, micro-particles coated with DNA to be bombarded with gene gun are made up of (a)
 Silver or Platinum (b) Platinum or Zinc (c) Silicon or Platinum (d) Gold or Tungsten
178. Which one is a true statement regarding DNA polymerase used in PCR
 (a) It is used to ligate introduced DNA in recipient cell
 (b) It serves as a selectable marker
 (c) It is isolated from a virus
 (d) It remains active at high temperature
179. If haemoglobin (Hb) of a normal individual and a sickle-cell patient are run in electrophoretic field lie/ ad show
 (a) same mobilities (b) different mobilities
 (c) Hb of patient will not move at all (d) Hbs are immobile.
180. A single strand of nucleic acid tagged with a radioactive molecule is called :
 (a) Vector (b) Selectable marker (c) Plasmid (d) Probe
181. PCR and Restriction Fragment Length Polymorphism are the methods for:
 (a) Study of enzymes (b) Genetic transformation
 (c) DNA sequencing (d) Genetic Fingerprinting
182. The figure below is the diagrammatic representation of the E.Coli vector pBR 322. Which one of the given options correctly identifies its certain component(s)?



- (a) ori - original restriction enzyme (b) rop-reduced osmotic pressure
(c) Hind III, EcoRI - selectable markers (d) amp^r, tet^r - antibiotic resistance genes
183. In genetic engineering, the antibiotics are used :
(a) as selectable markers (b) to select healthy vectors
(c) as sequences from where replication starts (d) to keep the cultures free of infection
184. Biolistics (gene-gun) is suitable for:
(a) Disarming pathogen vectors
(b) Transformation of plant cells
(c) Constructing recombinant DNA by joining with vectors
(d) DNA finger printing
185. Two microbes found to be very useful in genetic engineering are-
(a) Crown gall bacterium and Coeroshabalites (b) Escherichia coli and Agrobacterium
(c) Vibria cholerea and a tailed bacteriophage (d) Diplococcus sp and Pseudomonas sp
186. Lingoes catalyses the formation of bonds between-
(a) C = O (b) C = C (c) C – H (d) H – H
187. In PAGE_____gel is used-
(a) Polyacrylamide (b) Agar (c) Agarose (d) All of these
188. Expand PAGE-
(a) Polyacrylamide gel Electro phoresis (b) Polyacrylamide glycol Ethylene
(c) Polyethylene (d) Glycol Electrophoresis
189. Expand AGE-
(a) Agarose gel electrophoresis (b) Agarose germplasm electrophoresis
(c) Aderine Guanire Electrophases (d) None of these
190. Expand EFB_____
(a) European Federation of Biotechnology (b) European Furds of Biotechnology
(c) Ecology feed back (d) None of these
191. HPa I is obtained from
(a) Bacillus anylogiquefaciens H (b) Haerophilina influence Rd
(c) Haenophilus parainfluenzae (d) Moraxella spp.
192. Genetic engineering-
(a) Involves introduction and multiplication of undesirable genes along with the desirable genes
(b) Preserves Hereditary characters
(c) Introduce only desired gene into the target Organism
(d) It is time communing
193. Disadvantages of traditional Lybridination as-
(a) It involves multiplication of only undesired genes and not of desired gene
(b) It is time communing
(c) It involves introduction and multiplication of undersiable gene along with the desirable genes
(d) Both (a) and (c)

194. Berg introduced a gene of _____ into a bacterium with the help of Lambda phage-
 (a) VS-30 (b) SS-20 (c) ST-50 (d) SV-40
195. _____ is known as "Father of genetic Engineering-"
 (a) Paul Berg (b) W. Arber (c) S. Linn (d) Herbert Boyer

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	b	a	d	a	d	b	c	c	c	b	a	c	a	c	a	a	b	a	c	b
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	a	d	d	d	b	b	a	c	c	a	c	c	b	a	c	a	d	d	c	d
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	b	b	a	a	d	b	a	b	c	c	d	c	d	b	d	b	a	a	d	d
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	d	b	a	a	d	a	b	c	c	a	a	c	b	c	d	c	c	b	d	d
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	b	b	c	b	b	a	d	d	c	a	c	c	a	b	a	d	b	a	c	b
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	b	a	d	d	d	a	a	d	a	a	b	d	b	a	b	d	b	a	c	d
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	c	c	d	c	c	c	a	a	d	a	c	d	c	d	a	b	a	b	d	
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	a	b	b	a	a	d	d	c	d	a	b	a	c	c	a	c	a	a	c	d
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	a	c	d	b	a	d	d	c	c	c	b	c	a	b	c	b	d	d	b	d
Ques.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195					
Ans.	d	d	a	b	b	a	a	a	a	a	c	c	d	d	a					

1. Bt toxin is -
 - (a) Intracellular lipids
 - (b) Intracellular crystalline protein
 - (c) Extracellular crystalline protein
 - (d) Intracellular polysaccharide
2. *cry-genes* have been introduced in -
 - (a) Cotton and corn
 - (b) Rice
 - (c) Potato and Soyabean
 - (d) All
3. Which of the following is for increasing food production?
 - (a) Agro-chemical based agriculture
 - (b) Organic agriculture
 - (c) Genetically engineered crop-based agriculture
 - (d) All
4. Biotechnology deals with industrial scale production of biopharmaceuticals and biologicals using genetically modified-
 - (a) Microbes only
 - (b) Fungi Only
 - (c) Plants and animals only
 - (d) All of the above
5. The application of biotechnology includes all except -
 - (a) Therapeutics
 - (b) Diagnostics
 - (c) Conventional hybridization
 - (d) Bioremediation
6. Three critical research areas of biotechnology are -
 - I. Providing the best catalyst in the form of improved organism usually a microbe or pure enzyme
 - II. Multiple Ovulation Transfer Technology (MOET)
 - III. Creating optimal conditions through engineering for a catalyst to act.
 - IV. Downstream processing technologies
 - (a) I, II, III, IV
 - (b) I, III, IV
 - (c) I, II
 - (d) II and IV
7. Which of the following is not included under the application of biotechnology?
 - (a) Genetically modified crops
 - (b) Processed food
 - (c) Waste treatment; and energy production
 - (d) None
8. The crops having *cry-genes* need -
 - (a) No insecticide
 - (b) Mild quantity of insecticide
 - (c) Large amount of insecticide
 - (d) 5 kg insecticide / hectare
9. *Bacillus thuringiensis* is a bacterium of-
 - (a) Small intestine
 - (b) Dirty water
 - (c) Skin of dog
 - (d) Soil
10. First transgenic crop is -
 - (a) Cotton
 - (b) Pea
 - (c) Tobacco
 - (d) Flax
11. Which is not a transgenic plant?
 - (a) Soyabean
 - (b) Maize
 - (c) Golden rice
 - (d) Cucumber
12. Strains of *Bacillus thuringiensis* are used in producing -
 - (a) Bioinsecticidal plants
 - (b) Biomineralization
 - (c) Biometallurgical techniques
 - (d) Biofertilizers

13. Which of the following statements is false?
- Insulin was originally extracted from pancreas of slaughtered pigs and cattle
 - Animal insulin is difficult to obtain
 - Animal insulin is identical to human insulin
 - Non human insulin caused some patients to develop allergy
 - Recombinant DNA allowed scientists to insert a human insulin gene into a bacterial expression vector
 - Recombinant insulin is actually obtained from *E. coli* bacterial cell
- (a) Only I and II (b) Only III and IV (c) Only III (d) Only VI
14. Which of the following is a correct statement?
- "Bt" in Bt-cotton indicates that it is genetically modified organism produced through Biotechnology
 - Somatic hybridization involves fusion of two complete plant cells bearing desired genes
 - The anticoagulant hirudin is being produced from transgenic *Brassica napus* seeds
 - "Flavr Savr" variety of tomato has enriched the production of ethylene which improves its taste
15. The first human drug made using recombinant DNA technology was-
- (a) Glyphosate (b) TPA (c) Insulin (d) Erythropoietin
16. Which of the following is correct?
- The proteins encoded by the genes *cryIAc* and *cryIAb* control cotton bollworms
 - Protein encoded by *cryIAb* controls corn borer
 - Both
 - Proteins encoded by *cryIAc* and *cryIAb* control flies
17. Fill up the blanks -
At present, about _____ recombinant therapeutics have been approved for human-use the world over. In _____ of these are presently being marketed.
- (a) 30,12 (b) 40,20 (c) 109,32- (d) 111,9
18. Bt toxin genes are isolated from *Bacillus thuringiensis* and incorporated into crop plants making them insecticidal. The choice of genes depend upon-
- Crop plant only
 - Targeted pest only
 - Both a and b
 - neither type of crop nor targeted pest
19. mRNA silencing is called -
- RNAi
 - RNA activation
 - RNA without initiation codon
 - RNA is not producing interferon
20. How does Bt toxin kill the larvae of certain insects?
- by binding of activated toxin on mid gut epithelial cells, creating pores, leading to swelling and lysis
 - By stopping transcription of larval cells
 - By altering central dogma taking place in the cells of gut of larva
 - by stopping protein synthesis
21. The RNAi stands for -
- (a) RNA inactivation (b) RNA initiation (c) RNA interference (d) RNA interferon

22. Bt toxin is harmful to insects like -
 (a) Lepidoterans (tobacco budworm, armyworms) (b) Coleopterans (battles)
 (c) Dipterans (flies and mosquito) (d) All
23. Which of the following nematode infects the roots of tobacco plants and causes a great reduction in yield?
 (a) *Wuchereria* (b) *Ancylostoma*
 (c) *Meloidegryne incognitia* (d) *Enterobius*
24. Introduction of trangenese will result in -
 (a) Formation of new species (b) Formation of new protein
 (c) Alter a biosynthetic pathway (d) Both b and c
25. Antisense RNA is -
 (a) RNA that makes opposite sense (b) RNA that investigators find confusing
 (c) The noncoding strand of DNA molecule (d) RNA that is complementary to certain mRNA
26. A plant expressing a gene from another organisms is -
 (a) Transgenic (b) Clone (c) Transformed (d) Somoclonal variant
27. Bt gene produces protein toxin to insect larvae is -
 (a) Cry (b) ciy (c) Typ (d) trp
28. Bt toxin is -
 (a) Extotoxin biodegradable insecticide (b) Extotoxin, bionodegradable insecticide
 (c) Endotoxin biodegradable insecticide (d) Endotoxin, bionodegradable insecticide
29. I. Recombinant DNA technology is used to improve crop plants by increasing their productivity, by making them more nutritious and by developing disease resistant.
 II. Bt cotton is resistant to bollworm infestation.
 III. *Bacillus thuringiensis* form cry protein during any phase of their growth
 IV. *Bacillus thuringiensis* is not harmed by self Cry protein because of its occurrence as protoxin (inactive)
 V. Protoxin Cry protein is changed into active Cry protein in the stomach of insects due to alk ne pH in stomach
 (a) All are correct (b) I and IV are correct (c) Only III is false (d) All are false
30. Genetically modified tobacco plant with Bt gene is resistant to -
 (a) Bollworms (b) Hornworms (c) Hookworms (d) Roundworms
31. Bt is resistant to -
 (a) Viruses (b) Abiotic stress (c) Bollworm (d) Herbicide
32. Bt cotton farming has shown good results in -
 (a) Malwa (Punjab) (b) Katihar (Bihar)
 (c) Kolkata (West Bengal) (d) Shimla
33. Several nematodes parasitise -
 (a) A wide variety of plants (b) A wide variety of animals
 (c) Human (d) All

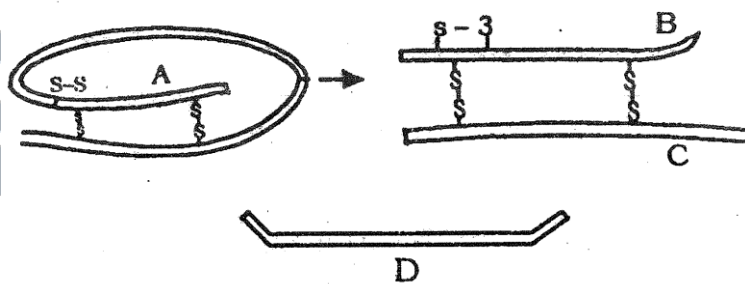
34. When DMA is transcribed into mRNA, usually the mRNA remains single-stranded, but in some cases an RNzA can k made that is complementary to the mRNA. This is called _____ and its main function is to _____
- (a) Antisense RNA, block gene expression (b) Antisense RNA, amplify mRNA
(c) Antisense RNA, enhance translation (d) Reverse transcription, enhance translation
35. Which of the following is the source of complementary strand in mRNA silencing.
- (a) An infection by viruses having RNA genome (b) Mobile genetic elements (Transposons)
(c)Both (d) Proteins
36. A doctor while operating on an HIV + patient accidentally cut himself with a scalpel. He comes to you, suspectir himself to have contracted the virus which test will you advise him to rule out/ confirm his suspicion?
- (a) PCR (b) Routine urine examination
(c)TLC (d)DLC
37. When a patient with defective ADA was treated, which of the following steps was performed for gene therapy?
- I. Lymphocytes were obtained from the patients ,
II. Lymphocytes are transferred to culture dishes
III. Lymphocytes were transfected with normal ADA genes
IV. The transfected cells are returned to the patients
- (a)All (b) Only III and IV (c) Only IV
38. Which of the following techniques serve the purpose of early diagnosis?
- I. R-DNA technology
II.PCR
III.ELISA
IV. Conventional method of diagnosis (serum, urine analysis, etc)
- (a) 1,11,111 (b) IV only (c) III only (d)All
39. Human gene therapy requires-
- (a) Gene isolation (b) Introduction of DMA into target cells
(c) Inclusion of a promoter sequence (d) All
40. Why is repeated transfusions of genetically engineered cells required in SCID patients?
- (a) Transfused cells have a limited life span (b) The introduced gene is mutated
(c) Transfused cells are immortal (d) Both a and b
41. Which of the following could be a permanent cure for treatment of severe combined immunodeficiency (SCID) -
- (a) Bone marrow transplantation (b) Gene therapy
(c) Enzyme replacement therapy (d) Both a and c
42. For effective treatment of a disease -
- (a) Early diagnosis is needed but understanding of its pathophysiology is not needed
(b) Early diagnosis is not needed but understanding of its pathophysiology is needed
(c) Early diagnosis arid understanding of its pathophysioiGgy are needed

(d) Neither early diagnosis nor understanding of its pathophysiology is needed

43. "Silencing" of mRNA molecule in order to control the production of a harmful protein has been used in protection of plants from-
(a) Nematodes (b) Mosquitoes (c) Beetles (d) Flies
44. The first clinical gene therapy was given in 1990 to a 4 years old girl with which of the following enzyme deficiency?
(a) Adenosine deaminase (ADA) (b) Tyrosine oxidase
(c) Monoamine oxidase (d) Glutamate dehydrogenase
45. Why is insulin not administered orally to a diabetic patient?
(a) Insulin is bitter in taste
(b) Insulin is a peptide
(c) Insulin will lead to a sudden decrease in blood sugar if given orally
(d) Insulin leads to peptic ulcer if given orally !.
46. Which of the following peptide chain is removed during maturation of pro-insulin into insulin?
(a) A peptide (b) B-peptide (c) C-peptide (d) A and C peptide
47. RNA interference (RNAi) technique has been devised to protect the plants from nematode. The plant is silenced by _____ produced by the host plant.
(a) dsDNA (b) ssDNA (c) dsRNA (d) target proteins
48. Which technique would you expect to be completely curative in SCID?
(a) Gene therapy in adult stage (b) Gene therapy in embryonic stage
(c) Bone marrow transplantation (d) Enzyme replacement therapy
49. Which of the following is a benefit to having insulin produced by biotechnology?
(a) It is just as effective and is less expensive (b) It can be mass-produced
(c) It is non-allergic (d) All
50. Following are the steps in one type of gene therapy -
I. Inject engineered cells into patient's bone marrow
II. Viral DNA carrying the normal allele inserts into chromosome
III. Let retrovirus infect bone marrow cells that have been removed from patient and cultured
IV. Insert RNA version of normal allele into retrovirus
Which of the following is the correct sequence of steps -
(a) I, II, III, IV (b) IV, III, II, I (c) I, II, IV, III (d) IV, III, I, II
51. Which of the following is correct about ADA?
(a) ADA is crucial for immune system to function
(b) In the absence of this enzyme, purine metabolism is disturbed and T-cells fail to function
(c) ADA deficiency is caused by deletion of the gene for ADA
(d) All
52. Transgenic rats, rabbits, pigs, sheep, cows and fish have been produced. Although over 95 percent of all existing transgenic animals are-
(a) pigs (b) fish (c) rats (d) mice
53. What might be an advantage of beginning gene therapy prior to birth?

- (a) This would give the body plenty of time to utilize the new genes
 (b) The body would not reject it as it hasn't yet recognised "self"
 (c) Since cells are extremely young, they are more receptive of gene therapy
 (d) There probably isn't any advantage
54. Which one is correct?
 (a) Bone marrow transplants are not a problem for patients with SCID.
 (b) Many simple organisms can become transgenic. Humans are too complex to become transgenic
 (c) Insulin is a protein and would be digested if ingested
 (d) All
55. Deliberate alteration of genome for treatment of disease is called -
 (a) Transformation rescue (b) Imprinting (c) Exon shuffle (d) Gene therapy
56. A functional ADA cDNA can be introduced into cells of the patients receiving gene therapy by using vector constituted by-
 (a) *E. coli* (b) Reovirus (c) Retrovirus (d) *Agrobacterium*
57. Which one of the following genes is defective in patients suffering from severe combined immunodeficiency syndrome (SCID)?
 (a) RNAase (b) ADA
 (c) Ribonucleotide reductase (d) DNAase
58. DNA hybridization technique is based on all of the following properties of DNA except -
 (a) Double-strandedness and base-pairing properties
 (b) Denaturation renaturation properties
 (c) Minor and major grooves
 (d) Sequence specificity
59. Which of the following is based upon the principle of antigen-antibody interaction?
 (a) PCR (b) ELISA (c) R DNA technology (d) RNA
60. PCR is used to -
 (a) detect HIV in suspected AIDS patients (b) Detect mutations in genes in suspected-cancer patients
 (c) Identify many genetic disorders (d) All
61. A sample of DNA from a person suspected of having sickle-cell anaemia is subjected to DNA hybridization using two probes. One that binds to the normal allele and another that binds to the sickle-cell allele. If both probes bind to the DNA, this individual -
 (a) Is homozygous dominant for the sickle-cell gene
 (b) Is heterozygous for the sickle-cell gene
 (c) Is heterozygous recessive for the sickle cell gene
 (d) Has sickle cell anaemia
62. Which of the following is a critically important tool used in experiments involving DNA hybridization?
 (a) DNA sequencing machines (b) Ligase
 (c) DNA probes (d) Vectors
63. A nucleic acid probe might be used to -

- (a) Insert genes into a host cell (b) Make DMA for gene cloning
(c) Splice pieces of DMA (d) Find a nucleotide sequence
64. Transgenic animals are those which have -
(a) Foreign DNA in some of its cells (b) Foreign DNA in all its cells
(c) Foreign RNA in all its cells (d) both a and c
65. The technique by which "Dolly" the sheep was obtained, is called -
(a) Cloning by gene transfer (b) Cloning by nuclear transfer
(c) Cloning tissue culture of somatic cells (d) Cloning without help of gametes
66. Which method of cellular defence is common to all eukaryotic organisms?
(a) RNA interference (b) Phagocytosis (c) VNTR (d) Reverse transcription
67. Following are the steps of southern blot procedure.
I. Autoradiography
II. Hybridization with radioactive nucleic acid (probe)
III. Blotting
IV. DMA fragments are treated to make them single stranded
V: Electrophoresis
VI. Clearing of DMA by restriction endonuclease
VII. isolation of DMA from sample
The correct sequence is -
(a) 1,2,3,4,5,6,7 (b) 7,6,5,4,3,2, 1 (c) 1,2,6,7,3,4,5 (d) 7, 6, 1,2, 5, 3, 4
68. The DMA probe, 3' - GGCTTA, will hybridize with which of the following?
(a) 5'-CCGUUA (b) 5'-GGCTTA (c) 5'-CCGAAT (d) 3'-CCGAAT
69. Given below is a diagrammatic sketch of maturation of insulin. Select the correct set of the names labelled A, B, and D.



- | | A | B | C | D |
|-----|------------|-----------|-----------|----------------|
| (a) | Proinsulin | B-peptide | A-peptide | Insulin |
| (b) | Proinsulin | A-peptide | B-Peptide | Free C Peptide |
| (c) | Proinsulin | A-peptide | B-peptide | Insulin |
| (d) | Proinsulin | B-Peptide | A-peptide | Free C peptide |
70. Which Indian plants have either been patented or attempts have been made to patent them by western nation for their commercial use?
(a) Basmati rice (b) Turmeric (c) Neem (d) All of these have been targetted
71. Which variety of rice was patented by a U.S company even though the highest number of varieties of this

rice is four in India?

- (a) Sharbati Sonara (b) Co-667 (c) Basmati (d) Lerma Roja

72. The use of bioresources by multinational companies and other organisations without proper authorisation from the countries and people concerned without compensatory payment is called -
(a) Bioethics (b) Biopiracy (c) Bioterror (d) Bioweapon
73. How many varieties of rice has been estimated to be present in India?
(a) 2,000 (b) 20,000 (c) 200,000 (d) 2,000,000
74. Introduction of genetically modified food is not desirable because -
(a) Allergies and toxicity may be caused
(b) Incorporation of antibiotic resistance in human beings
(c) Disturbance in metabolism due to enzyme for antibiotic resistance
(d) All
75. Which of the following statements is correct?
(a) The current interest in the manipulation of microbes, plants and animal has raised serious ethical issues
(b) One possible risk of genetic engineering is the accidental production of dangerously resistant microorganisms
(c) Although risks are possible, genetic engineering appears to offer more of a contribution to human welfare than threats
76. "Pharming" is a term that describes -
(a) Animal used in transgenic research
(b) Plants making genetically altered foods
(c) Synthesis of recombinant drugs by bacteria
(d) Synthesis of a protein drug in the milk of a transgenic animal
77. Which of the following is correct?
(a) The procedure for chemical safety testing / toxicity is the same as that used for testing toxicity of drugs.
(b) Transgenic animals are more sensitive to the toxic substances than non-transgenic animals
(c) Golden rice, a genetically engineered rice has high vitamin A (retinol) content
(d) All
78. To test the vaccine safety before its use on human, transgenic _____ are used to test. If successful, _____ are used to test the safety of vaccine-
(a) Mice, monkeys (b) Monkeys, mice (c) Cows, mice (d) Sheep, cows
79. GMO / transgenic animal are used in testing safety of polio vaccine before they are used on human?
(a) Transgenic sheep (b) Transgenic cow (c) Transgenic viruses (d) Transgenic mice
80. Rosie was produced in year -
(a) 2001 (b) 1999 (c) 1997 (d) 2009
81. "Rosie" a transgenic cow known to produce a type of milk which has all the following characteristics except -
(a) Protein content of 2.4 gm/litre (b) Has human α -lactalbumin
(c) More balanced diet than normal milk for babies (d) None
82. Which of the following transgenic protein product has been used to treat emphysema -
(a) α -lactalbumin (b) Cry protein (c) γ -globulin (d) OM-antitrypsin
83. In which disease the advancement of genetic engineering has still not been used as clinical cure. *

- (a) Ancephaly (b) Emphysema (c) Phenylketonuria (d) Cystic fibrosis
84. Bioaugmentation is
 (a) The addition of commercially prepared bacterial strains with specific catabolic activities to degrade wastes.
 (b) Production of fertilizers by using bacteria
 (c) The metals are deposited as insoluble oxides and sulphides by activity of bacteria
 (d) Removal of pests
85. Transgenic animals are produced for which of the following purposes?
 I. To study-how gene are regulated and how they affect the normal functions of body and its development
 II. To study of diseases
 III. To obtain useful biological product
 IV. To test vaccine safety and chemical safety
 (a) All (b) I and IV (c) II and IV (d) Only I
86. Cyanogen bromide is used in _____.
 (a) Genetic finger printing (b) Tissue culture (c) synthesis of humulin (d) Hybridoma technology
87. Which one of the following is not an application of DNA finger printing?
 (a) Solving immigration cases (b) Solving paternity cases
 (c) Therapy for curing SCID (d) identifying gene mutation
88. Technique of production of monoclonal antibodies was developed by
 (a) Fredrick Miescher (b) Bentham and Hooker (c) Milstein and Kohler (d) Watson and Crick
89. Which of the following cannot be patented
 (a) GM plants (b) New substance of utility (c) New species of plants (d) Wind energy.
90. A genetically engineered microorganism used successfully in bioremediation of oil spills is a species of
 (a) *Xanthomonas* (b) *Bacillus* (c) *Pseudomonas* (d) *Thchodemuz*.
91. Reagent used in ELISA test is
 (a) Endonuclease (b) Polymerase (c) Ligase (d) Peroxidase.
92. Strains of *Bacillus thuringiensis* (Bt) are used in producing
 (a) Bioinsecticidal plants (b) Biominer sation
 (c) Biometallurgical techniques (d) Biofertilizers.
93. A transgenic crop has genes for
 (a) Synthesis of new proteins (b) Resistance to antibiotics
 (c) Formation of enzymes for antibiotics (d) All the above.
94. Bt toxin is
 (a) Intracellular lipid (b) Intracellular crystalline protein
 (c) Extracellular crystalline protein (d) Lipid.
95. Transgenic Golden Rice is enriched with high
 (a) Lysine (b) Methionine (c) Glutenin (d) Vitamin A.
96. Transgenic bacteria are being used for producing
 (a) Epinephrine (b) Human insulin (c) Thyroxine (d) Cortisol.
97. Addition of foreign gene into a crop is

- (a) Genetic engineering (b) Biotechnology (c) Tissue culture (d) Immunisation
98. A transgenic food crop which may help in solving the problem of night blindness in developing countries is
 (a) Golden Rice (b) Bt Soya bean (c) FlavrSavr Tomato (d) Starlink Maize.
99. Main objective of producing herbicide resistant GM crops is
 (a) Encourage ecofriendly herbicides
 (b) Reduce herbicide accumulation in food articles for health safety
 (c) Eliminate weeds from fields without the use of manual labour
 (d) Eliminate weeds from the fields without the use of herbicides.
100. It is now possible to breed plants and animals with desired characters through
 (a) Genetic engineering (b) Chromosome engineering
 (c) Ikebanatechnique (d) Bonsai technique.
101. A transgene expression can achieve which of the following ?
 (a) Prevent expression of a native gene
 (b) Modify an existing biosynthetic pathway
 (c) Produce a protein that itself produces the phenotype of interest or is the product of interest
 (d) All the above.
102. Biopiracy is related to which of the following :
 (a) Traditional knowledge
 (b) Biomolecules and regarding bioresources genes isolated from bioresources
 (c) Bioresources
 (d) All the above.
103. Which is being synthesized by genetic engineering?
 (a) Insulin (b) Renin (c) Thyroxine (d) Progesterone.
104. How many recombinant therapeutics have been approved for human-use the world over?
 (a) 12 (b) 30 (c) 20 (d) 18
105. In some children, ADA deficiency can be cured by :
 (a) Bone marrow transplantation (b) Enzyme replacement therapy
 (c) Both (d) None
106. Today, transgenic models exist for many human diseases which includes-
 A. Cancer B. Cystic fibrosis
 C. Rheumatoid arthritis D. Alzheimer's disease
 (a) A and C only (b) B and C only (c) A, B and C only (d) A, B, C and D
107. Molecular probes use for identification or recombinant clone carrying the desired DNA insert can be-
 A. denatured double stranded DNA probes B. double stranded RNA probes
 C. protein probes D. single stranded DNA probes.
 (a) A, B (b) B, C (c) A, D (d) A, B, C, D

108. Consumption of which one of the following foods can prevent the kind of blindness associated with vitamin A deficiency?
- (a) Raver Savr¹ tomato (b) Canolla (c) Golden rice (d) Bt-Brinjal
 (a) A, B (b) B, C (c) A, B, C (d) A, B, C, D
109. The decisions regarding the validity of genetic modification research and the safety of introducing genetically modified organisms for public services in India is taken by-
- (a) national biotechnology board (NBTB) (b) department of biotechnology (DBT)
 (c) department of science and technology (DST) (d) Genetic engineering approval committee (GEAC)
110. Tobacco plants resistant to a nematode have been developed by the introduction of DMA that produced (in the host cells).
- (a) both sense and anti-sense RNA (b) a particular hormone
 (c) an antifeedant (d) a toxic protein
111. Which Indian plants have either been patented or attempts have been made to patent them by western nations for their commercial uses.
- A. basmati rice B. turmeric C. neem D. none
112. Select the correct statement(s) -
- (a) genetic engineering works only on animals and has not yet been successfully used on plants.
 (b) There are no risks associated with DMA technology.
 (c) The first step in PCR is heat is used to separate both the strands of target DMA.
 (d) DMA from one organism will not bond to DMA from another animal.
113. Which one of the following statement is not true.
- (a) The majority of baculoviruses used as biological control agents are in the genus Nucleopolyhedrovirus
 (b) Nucleopolyhedrovirus are excellent candidates for broad-spectrum insecticidal applications
 (c) Nucleopolyhedrovirus have no negative impacts on plants, mammals, birds, fish or even on non-target insects
 (d) This is especially desirable when beneficial insects are being conserved to aid in an overall IPM programme
114. The first clinical gene therapy was given for the deficiency of which of the following enzymes?
- (a) adenosine deaminase (ADA) deficiency (b) tyrosinase deficiency
 (c) homogentisic acid oxidase deficiency (d) phenylalanine hydroxylase deficiency
115. Which of the following is/are product(s) of genetic engineering -
- A. Humulin B. hepatitis B vaccine prepared by yeast
 C. golden rice D. Bt cotton
 (a) A, B (b) B, C (c) A, B, C (d) A, B, C, D
116. Which of the following statements is / are true about genetically engineered insulin?
- A. its name is humulin
 B. it was manufactured by American firm Eli Lilly
 C. it was launched on 5 July 1983
 D. it is produced by the fermentation of appropriate recombinant *E. coli* clones,

- (a) A, B (b) B, C (c) A, B, C (d) A, B, C, D
117. Which of the DNA sources would be suitable for DNA finger printing -
 A. hair B. semen C. saliva D. RBC
 (a) A, B (b) B, C (c) A, B, C (d) A, B, C, D
118. Genetic modification has -
 A. made crops more tolerant to abiotic stresses. B. reduced reliance on chemical pesticides.
 C. increased efficiency of minerals use by plants. D. enhanced nutritional value of food.
 (a) A, B (b) B, C (c) A, B, C (d) A, B, C, D
119. Which of following is / are correct?
 A. gene therapy has been tested on a large number of patients with a wider variety of inherited genetic disorders, and in numerous cases it has produced a complete cure.
 B. genetic engineering has been used to mass produce insulin for diabetes.
 C. DNA hybridization is the base pairing of DNA from two different sources
 D. genetic engineering is a technique of plant breeding.
 (a) A, B (b) B, C (c) A, B, C (d) A, B, C, D
120. Genetic engineering can be used to-
 A. alter the performance of genetically modified organism.
 B. produce multiple copies of a desired DNA sequence.
 C. Generate many copies of specific genes.
 D. Enhance the production of a specific gene product.
 (a) A, B (b) B, C (c) A, B, C (d) A, B, C, D
121. Which statement is correct?
 A. Somaclonal variations are the variations observed in plants regenerated from somatic cultures.
 B. A transgenic crop is one that contains and expresses a transgene.
 C. Chloromycetin is obtained from *Penicillium*.
 D. Bioprospecting is the search for known compounds.
 (a) A, B (b) B, C (c) C, D (d) A, B, C, D
122. PCR is routinely used to detect
 (a) HIV (b) Cancer (c) TB (d) Cholera
123. _____ was first to introduce a gene into a bacterium with the help of lambda phage.
 (a) Paul Berg (b) Stanley Cohen (c) Howard Tennen (d) Herbert Boyer
124. The techniques which alter the chemistry of DNA and introduce them into host organism, is known as-
 (a) Hybridisation (b) Somatic embryo genesis
 (c) Micropropagation (d) Genetic engineering
125. Genetic engineering is used in-
 (a) Obtaining transgenic plants (b) Gene therapy
 (c) Vaccine production (d) All the above
126. Traditional biotechnology is used in-
 (a) Gene synthesis
 (b) Production of organic acids, vitamins and hormones
 (c) Production of edible vaccines
 (d) In vitro fertilisation
127. EFB stands for-

- (a) European foundation of biotechnology (b) European federation of biotechnology
(c) European foundation of biosciences (d) None of the above
128. What is true about Bt toxin
(a) Bt toxin exists as active toxin in the bacillus
(b) The activated toxin enters the ovaries of the pest to sterilise it and thus prevent its multiplication
(c) The concurred *Bacillus* has anti toxins
(d) The inactive proto toxin gets converted into active form in the insect gut
129. The bacterium *Bacillus thuringiensis* is widely used in contemporary biology as-
(a) Insecticide (b) Agent for production of dairy products
(c) Source of industrial enzyme (d) Indicator of water pollution
130. A genetically engineered micro-organism used successfully in bioremediation of oil spills in a species of-
(a) *Trichoderma* (b) *Xanthomonas* (c) *Bacillus* (d) *Pseudomonas*
131. Hirudin is-
(a) a protein produced by *Hordeum vulgare* which is rich in lysine
(b) A toxic molecule isolated from *hirsutum* which reduces human fertility
(c) A protein produced from transgenic *Brassica napus* which prevents blood clotting
(d) An antibiotic produced by a genetically engineered bacterium *Escherichia coli*.
132. Interferon is a glycoprotein which is
(a) antibacterial (b) antifungal (c) antiviral (d) all of these
133. Terminator gene
(a) is used in hybridization (b) helps in terminating seed germination
(c) helps in delayed flowering (d) is used for production of insulin
134. Which of the following is used for the treatment of Cancer?
(a) Tetracycline (b) TSH (c) Insulin (d) HGH
135. Which one of the following is a correct statement?
(a) 'Flavr Savr' variety of tomato has enhanced the production, of ethylene which improves its taste.
(b) Somatic hybridization involves fusion of two intact plant cells having desired genes.
(c) The anticoagulant hirudin is being produced from transgenic *Brassica napus* seeds.
(d) 'Bt' in Bt cotton indicates that it is a genetically modified organism.
136. Bt cotton is resistant to
(a) drought (b) herbicides (c) salts (d) insects
137. Detection of a clone is done by
(a) gel electrophoresis (b) autoradiography (c) PCR (d) all of these
138. Which one is not correct?
(a) ELISA is based on the principle of antigen-antibody interaction.
(b) First transgenic cow, Rosie was produced in 1997.
(c) Gene therapy is used to treat hereditary diseases.
(d) Human insulin is not made in bacteria.
139. Genetically-engineered bacteria are being employed for production of
(a) thyroxine (b) human insulin (c) cortisol (d) all of these
140. Rules of conduct that may be used to regulate our activities in relation to the biological world is called
(a) bioethics (b) biowar (c) biopatent (d) biopiracy
141. Use of bioresources of other nations without proper authorization of the countries concerned is called
(a) biowar (b) biopatent (c) biopiracy (d) all of these
142. It is now possible to breed plants and animals with desired characters through
(a) genetic engineering (b) ikebana technique
(c) tissue culture (d) chromosomal engineering

143. A genetically-manipulated organism containing in its genome one or more inserted genes of another species is called
(a) transposon (b) gene expression (c) transgenic organism (d) all of these
144. Which statement is incorrect about gene therapy?
(a) Lymphocytes from patient's blood are cultured.
(b) A functional ADA CDNA is introduced into these lymphocytes.
(c) Lymphocytes are then introduced in the body of patient. .
(d) Patient does not require periodic infusion of genetically engineered lymphocytes.
145. Which enzyme is crucial for proper functioning of the immune system?
(a) Adenosine deaminase (b) Restriction endonuclease (c) Ligase (d) Maltase
146. The first hormone produced artificially by culturing bacteria was
(a) adrenaline (b) testosterone (c) insulin (d) thyroxine
147. Genetically-engineered human insulin is manufactured by the use of which of the following microorganisms?
(a) *Penicillium* (b) *Rhizopus* (c) *E. coli* (d) *Pseudomonas*
148. What is correct about insulin?
(a) Two short polypeptide chains
(b) Polypeptide chains are linked together by disulphide bridges.
(c) In mammals insulin is synthesized as a prohormone.
(d) All the above
149. Which is incorrect?
(a) Specific Bt toxin genes have been isolated from *Bacillus thuringiensis*.
(b) *Meloidogyne incognita* does not infect the roots of tobacco plants.
(c) In mammals insulin is synthesized as a prohormone.
(d) ADA deficiency can be cured by bone marrow transplantation.
150. Which one is incorrect?
(a) Bt toxin gene has been cloned from the bacteria. (b) Bt toxin is coded by a gene named cry.
(c) *Bacillus thuringiensis* forms protein crystal throughout their life cycle.
(d) Bt toxin protein exist as inactive protoxins.
151. Proteins produced by *Bacillus thuringiensis* kill
(a) lepidopterans (b) coleopterans (c) dipterans (d) all of these
152. GM plants have been useful in increasing
(a) crop yield (b) reduce post harvest loss
(c) make crops more tolerant to stresses (d) all of these
153. Plants, bacteria, fungi and animals whose genes have been altered by manipulation are called
(a) genetically modified organisms (b) hybrid organisms
(c) pest resistant organisms (d) none of the above
154. Column I Column II
I. *Escherichia coli* (A) nif gene
II. *Bacillus thuringiensis* (B) Interferon
III. *Rhizobium meliloti* (C) Bt toxin
IV. *Pseudomonas putida* (D) Bioremediation
(a) I-B, II-A, III-D, IV-C (b) I-B, II-A, III-C, IV-D
(c) I-B, II-C, III-A, IV-D (d) I-D, II-A, III-B, IV-C
155. The process of RNA interference has been used in the development of plants resistant to
(a) Insects (b) Nematodes (c) Fungi (d) Viruses
156. Maximum number of existing transgenic animals is of
(a) Pig (b) Fish (c) Mice (d) Cow
157. The true statement about Genetic Engineering Approval committee (GEAC) is
(a) Will make decision regarding the validity of GM research

- (b) Will make the safety of introducing GM - organism for public services
 (c) Genetic modification of organism can have unpredictable results when such organisms are introduced into the ecosystem. Therefore, the Indian government has set up organisation such as GEAC.
 (d) All of these

158. **Column I** **Column II**
 I. Forensic science (A) AIDS
 II. ELISA (B) First man made hormone
 III. Humulin (C) Emphysema
 IV. α -1-antitrypsin (D) DNA finger printing.
 (a) I-B, II-A, III-D, IV-C (b) I-B, II-A, III-C, IV-D
 (c) I-B, II-C, III-A, IV-D (d) I-D, II-A, III-B, IV-C
159. Match List I and List II and select the correct option-
- | List I | List II |
|-----------------------------------|---------------------------------|
| (a) <i>Bacillus thurengiensis</i> | (1) Production of chitinases |
| (b) <i>Rhizobium meliloti</i> | (2) Scavenging of oil spills |
| (c) <i>E. coli</i> | (3) Incorporation of 'Mf' gene |
| (d) <i>Pseudomonas putida</i> | (4) Production of Bt toxin |
| (e) <i>Trichoderma</i> | (5) Production of human insulin |
- (a) a – 2, b – 1, c – 5, d – 3
 (b) a – 2, b – 5, c – 1, d – 3
 (c) a – 4, b – 5, c – 2, d – 1
 (d) a – 3, b – 5, c – 1, d – 2
160. Hybridoma technology has been successfully used in-
- | | |
|-----------------------------------|--|
| (a) Production of somatic hybrids | (b) Synthesis of monoclonal antibodies |
| (c) Synthesis of Laenoglobulin | (d) Production of alcohol in bulk |
161. Cultivation of Bt cotton has been much in the news. The prefix 'Bt' means-
- | |
|---|
| (a) Bacteria treated cotton seeds |
| (b) Bigger thread variety |
| (c) Produced by biotechnology using restriction enzymes and ligases |
| (d) Carrying on endotoxin gene from <i>Bacillus thuringiensis</i> |
162. **Column I** **Column II**
 I. DNA probe (A) Effort to fix the functional gene
 II. DNA library (B) DNA sequence that can pair with a particular gene
 III. Gene therapy (C) One organism's DNA stored in the host organism
 IV 200,000 varieties of rice (D) India
 (a) I-B, II-A, III-D, IV-C (b) I-B, II-A, III-C, IV-D
 (c) I-B, II-C, III-A, IV-D (d) I-D, II-A, III-B, IV-C
163. Which of the following is related with gene therapy?
- | | |
|-------------------------------|--------------------------------|
| A. Enzyme-replacement therapy | B. Bone marrow transplantation |
| C. Hybridoma technique | D. Hepatitis |
| (a) A, B | (b) B, C |
| (c) C, D | (d) A, B, C, D |
164. Humulin is
- | | | | |
|------------------|------------------|-----------------|----------------|
| A. an antibiotic | B. human insulin | C. antidiabetic | D. antifungal |
| (a) A, B | (b) B, C | (c) C, D | (d) A, B, C, D |

165. Column I
I. Biopiracy
II. Retroviral vector
III. Biopatent
IV. Kohler and Milstein
(a) I-B, II-A, III-D, IV-C
(c) I-B, II-C, III-A, IV-D
- Column II
(A) Gene therapy
(B) Elugal removal of biological materials
(C) Right granted for biological entities
(D) Monoclonal antibody
(b) I-B, II-A, III-C, IV-D
(d) I-D, II-A, III-B, IV-C
166. Interferon is
A. antimalarial
(a) A, B
- B. antifungal
(b) B, C
- C. antiviral
(c) C, D
- D. anticancer
(d) A, B, C, D
167. Column I
I. Golden Rice
II. Bt toxin
III. RNAi
IV. Rosie
(a) I-B, II-A, III-D, IV-C
(c) I-B, II-C, III-A, IV-D
- Column II
(A) Cry protein
(B) Rich in vit. A
(C) First transgenic cow
(D) Gene silencing
(b) I-B, II-A, III-C, IV-D
(d) I-D, II-A, III-B, IV-C
168. Which of the following is associated with transgenic animals?
A. Vaccine safety
(a) A, B
- B. Chemical safety
(b) B, C
- C. Biopiracy
(c) C, D
- P. Gene therapy
(d) A, B, C, D
169. Which bacteria is used as biopesticide first on the commercial scale in the world.
(a) *Bacillus thuringiensis*
(c) *Pseudomonas aeruginosa*
- (b) *E-Coli*
(d) *Agrobacterium tumefaciens*
170. Column I
I. DNA finger printing
II. And
III. *Agrobacterium*
IV. DNA probes
(a) I-B, II-A, III-D, IV-C
(c) I-B, II-C, III-A, IV-D
- Column II
(A) Tumour
(B) VNTR
(C) Monkey
(D) Radioactive isotopes
(b) i - C, ii - A, iii - B, IV - D
(d) I-D, II-A, III-B, IV-C
171. *Bacillus thuringiensis* (Bt) strains have been used for designing novel
(a) Biofertilisers
(c) Bio-mineralisation process
- (b) Bio-metallurgical techniques
(d) Bio-insecticidal plants
172. Column I
I. Virus free plant
II. Biofertilizer
III. Bt cotton
IV. Humulin
- Column II
(A) *Rhizobium*
(B) Cry gene
(C) Shoot apex
(D) Diabetes

- (a) I-B, II-A, III-D, IV-C (b) I-C, II-A, III-B, IV-D
(c) 1-8, 11-0, 111-A, IV-D (d) I-D, II-A, III-B, IV-C
173. Gene recombinant technology is used for-
(a) Vectorless gene transfer into target cell (b) Vector based gene transfer into target cell
(c) Direct transfer of DNA protein complex (d) Liposome based direct gene transfer into target cell
174. Hybridoma cells are-
(a) Nervous cells of frog (b) Hybrid cells resulting from myeloma cells
(c) Only cells having oncogenes (d) Product of spore formation in bacteria
175. Bacillus thuringiensis (Bt) is a bacterium of-
(a) Dirty water (b) Small intestine (c) Soil (d) Polluted air
176. Wine and beer are produced directly by fermentation, Brandy and whisky require both fermentation and distillation because-
(a) Fermentation is inhibited at an alcoholic level of 10–18%
(b) Distillation prolongs storage
(c) Distillation improves quality
(d) Distillation purifies the beverage
177. **Column I** **Column II**
I. Golden rice (A) Increased shelf life
II. FlavrSavr tomato (B) HGH
III. Mouse (C) Vitamin A
IV. Transgenic pig (D) Organ transplantation
(a) I-C, II-A, III-B, IV-D (b) I-B, II-A, III-C, IV-D
(c) I-B, II-C, III-A, IV-D (d) I-D, II-A, III-B, IV-C
178. Human insulin has 51 amino acids in two chains mark the correct statement-
(a) Chain A with 20, and chain B with 31 amino acids
(b) Chain A with 21, and chain B with 30 amino acids
(c) Chain A with 30, and chain B with 31 amino acids
(d) Chain A with 31, and chain B with 20 amino acids
179. Which of the following is used in Biowar ?
(a) A pathogen (b) Toxin from a pathogen
(c) A delivery system for the bioweapon agent (d) All the above
180. _____ is thousand times sweeter than sugar
(a) Brazzein (b) Stevia (c) Both (a) and (b) (d) Saccharine
181. 'Flavr Savr' is the transgenic variety of-
(a) Cotton (b) Rice (c) Tomato (d) Wheat
182. Transgenesis is _____ hybridization-
(a) Superior to (b) As good as (c) Inferior to (d) None of the above
183. When strong and developed countries, powerful organizations and multinational companies exploit biological

resources of other nations without proper authorization from and without any compensation to the nations concerned, it is called-

- (a) Biopatent (b) Bioethics (c) Biopiracy (d) Both (a) and (c)
184. Humulin is the term used for-
- (a) Human insulin (b) A sex hormone (c) A new antibiotic (d) a vaccine
185. Hybridomas are-
- (a) Hybrid zone (b) Hybrid cultures (c) Hybrid swarms (d) Antibodies
186. Gene coding for crystalline proteins are called-
- (a) Immunogenic (b) Therapeutic genes (c) Cry genes (d) Transgenes
187. Genetic engineering is-
- (a) Plastic surgery (b) Addition of genes
(c) Renal of genes (d) Study of extranuclear organelles
188. _____ first proposed that diabetes is caused by failure of the β -cells of the islets of Langerhans of pancreas to secrete a substance which is named as insulin-
- (a) Banting (b) Best (c) Edward Sharpe-Shafer (d) Sherlock
189. _____ isolated insulin from the dog's pancreatic islets and demonstrated its effectiveness against diabetes-
- (a) Edward Shafer (b) Sherlock (c) Banting and Best (d) Edward Sharpy
190. Edward Jenner is known as-
- (a) Father of immunology (b) Father of genetics
(c) Father of microbiology (d) Father of biology
191. Louis Pasteur is known as-
- (a) Father of microbiology (b) Father of immunology
(c) Father of genetics (d) Father of biology
192. Which of the following is a correct statement-
- (a) 'Bt' in Bt-cotton indicates that it is a genetically modified organism produced through biotechnology
(b) Somatic hybridization involves fusion of two complete plant cells carrying desired genes
(c) The anticoagulant Heparin is being produced from transgenic Brassica napus seed
(d) 'Flavr Savr' variety of tomato has retarded the production of ethylene which improves its taste
193. Transgenic plants are the ones-
- (a) Generated by introducing foreign DNA into a cell and regenerating a plant from the cell
(b) Produced after protoplast fusion in artificial medium
(c) Grown in artificial medium after hybridization in the field
(d) Produced by a somatic embryo in artificial medium
194. Which of the following correctly defines a transgenic animal?
- (a) An animal which has foreign DNA in all its cells because of an injection of DNA into the nuclei of the zygote from which it is developed
(b) An animal which has foreign DNA and RNA in some of its cells because of an injection of DNA into the nuclei of some of the cells in adulthood.
(c) An animal which has foreign DNA and RNA in some of its cells because of an injection of DNA and RNA into the nucleus of the zygote from which it is developed
(d) An animal which has foreign DNA in some of its cells because of an injection of DNA into the nuclei of some of the cells of the blastomeres.

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	b	d	d	d	c	b	d	a	d	c	d	a	c	c	c	c	a	c	a	d
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	c	d	c	d	d	a	b	d	c	b	c	a	d	a	c	a	a	a	d	a
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	b	c	a	a	b	c	c	b	d	b	d	d	b	d	d	c	b	c	b	d
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	c	c	d	b	b	a	b	c	b	d	c	b	c	d	d	d	d	a	d	c
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	d	d	a	a	a	c	c	c	d	c	d	a	d	a	d	b	a	a	c	a
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	d	d	a	b	c	d	c	c	d	a	c	c	b	a	d	d	d	d	b	d
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	a	a	a	d	d	b	b	d	a	d	c	c	b	d	c	d	b	d	b	a
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	c	a	c	d	a	c	c	d	b	c	d	d	a	c	b	c	d	d	c	b
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	d	c	a	b	b	c	a	a	a	c	d	b	b	b	c	a	a	b	d	a
Ques.	181	182	183	184	185	186	187	188	189	190	191	192	193	194						
Ans.	c	a	c	a	b	c	d	c	c	a	a	c	a	a						

1. Which of the following is the most ecologically relevant environmental factor?
 (a) Water (b) Light (c) Temperature (d) Soil
2. Which of the following might contribute to determining an organism's habitat?
 (a) Amount of sunlight (b) Temperature of soil
 (c) Humidity and other organisms (d) All
3. I. Organisms living in oceans, lakes and rivers face water-related problems.
 II. Euryhaline can tolerate a wide range of salinities
 III. Stenohaline are restricted to a narrow range of salinities
 IV. No freshwater animals cannot live for long in seawater but sea animals can live in freshwater for long time because of osmotic balance
 V. The salt concentration is less than 5% in inland water, 30-35% in sea and >100% in some hypersaline lagoons
 (a) All are correct (b) All are false (c) Only IV is wrong (d) Only I, III, V are correct
4. Major biomes of India include -
 (a) Tropical rain forest (b) Deciduous forest (c) Desert and sea coast (d) All
5. Next to temperature, which is the most important factor influencing the life of organisms?
 (a) Light (b) Soil (c) Water (d) Wind velocity
6. Which of the following is not a part of an organism's physical environment?
 (a) Temperature (b) Water (c) Shade (d) Other organisms
7. Ecology is basically concerned with four levels of biological organizations. These levels are -
 (a) Organisms, populations, communities and biomes (b) Organisms and communities, species and population
 (c) Species, populations, biomes and organisms (d) Organisms, populations, biomes and species
8. False statement is -
 (a) habitat includes both biotic and abiotic factors
 (b) Ecology at the organismic level is essentially physiological ecology
 (c) Abiotic and biotic components interact constantly with each other
 (d) None of the above
9. The location of terrestrial biomes is strongly influenced by -
 (a) Which animal species live in the area (b) Climate
 (c) Other nearby biomes (d) Which plant species live in the area
10. A few organisms can tolerate and thrive a wide range of temperature. Such animals are called _____. A vast majority of animals are restricted to a narrow range of temperature. Such animals are called _____.
 (a) Eurythermal, stenothermal (b) Stenothermal, eurythermal
 (c) Thermoscapic, Unthermoscapic (d) Thermophobic, thermophilic
11. Each of the following is an important factor in determining the productivity of freshwater lake except -
 (a) Nutrients (b) Depth
 (c) Proximity to marine coast (d) Temperature

12. Human can get homeostasis through-
- (a) Only physiological means (b) Only physical means
(c) Both physiological and physical means (d) neither physiological nor physical means
13. Deep (> 500m) in the oceans inhabitants are not aware of existence of a celestial source of energy called -
- (a) Sun (b) ATP (c) Photosynthesis (d) Chemosynthesis
14. The nature of soil in a given area is independent of -
- (a) Climate
(b) Weathering process
(c) Weather soil is transported or sedimentary and how the soil development occurred
(d) None of the above
15. The two sides of a given mountain have the same latitude and altitude. Are they likely to have the same climate?
- (a) No, because there is likely to be less water on the side of the mountain that faces away from the prevailing wind
(b) No, because there is always on desert on one side of a mountain
(c) Yes, because latitude and altitude are the two most important climate-controlling factors
(d) Yes, because locations at the same latitude all have the same climate
16. In regions of hot temperatures and wet climate, you will most likely find _____ biomes, whereas in the regions of hot temperature and dry climate you will find _____.
- (a) Desert, tropical (b) temperature, arid (c) Tropical, desert (d) Tundra, chaparral
17. I. Thermoregulation, osmoregulation and excretion are mechanisms that moderate change in the body.
II. 99% animals and almost all plants are conformers
III. Heat loss or heat gain is a function of surface area.
IV. Thermoregulation energetically least expensive process for many organisms like shrews and humming birds.
V. 99% animals are thermoregulator
VI. Archaeobacteria cannot tolerate high temperature
- (a) I and II are wrong (b) IV, V and VI are wrong (c) None is wrong (d) All are wrong
18. Which of the factors dictates the types of animal in a habitat - .
- (a) pH of the soil (b) Type of benthic animals
(c) Types of forests (d) Types of vegetation that support them
19. Which of the following term implies the maintenance of relatively constant physical and chemical conditions within organisms?
- (a) Homeostasis (b) Adaptation (c) Isometry (d) Acclimation
20. Find out the false one -
- (a) Texture of soil depends upon of size of mineral particles
(b) Soil aeration is inversely proportional to water holding capacity
(c) Waterlogged soil does not suit plants as it creates anaerobic environment
(d) Availability of minerals in soil is independent of soil pH
21. Many animals use the diurnal and seasonal variations in light intensity and photoperiod as cues timing of -
- (a) For age only (b) Reproductive activities only
(c) Migration only (d) All
22. Animals having a built-in thermostal to maintain constant body temperature are -
- (a) Biothermic (b) Poikilothermic (c) Oligothermic (d) Homeothermic

23. To a large extent, the vegetation of an area is determined by -
 (a) Physical + chemical properties of soil only
 (b) pH of soil
 (c) Physical + Chemical properties of soil and topography
 (d) Type of minerals in soil
24. Seasons are influenced by-
 (a) The tilt of earth on its axis
 (b) The amount of solar radiation reaching earth's surface
 (c) Earth's movement around the sun
 (d) All
25. Percolation and water holding capacity of soil is dependent upon -
 (a) Soil composition, grain size and aggregation
 (b) pH of soil
 (c) Colour of soil
 (d) holard
26. The ultimate source of energy for all ecosystems on earth is -
 (a) Photosynthesis (b) Sun (c) ATP (d) Creatine phosphate
27. Which of the following statements is false?
 (a) Earth's climate has varied in temperature overtime
 (b) Natural selection acts on the genetic variability present in the population so that it can adapt
 (c) The physical and biotic environments do not interact
 (d) The productivity and distribution of plants is heavily dependent upon on water
28. Life-
 (a) Originated on earth in water (b) Is sustainable with water only
 (c) Is possible without water (d) Both a and c are correct
29. Snow leopards are not found in Kerala forests. Which factor is responsible for it?
 (a) Temperature (b) Soil (c) Water (d) Light
30. I. Mango trees cannot grow in temperate countries like Canada and Germany
 II. Snow leopards are not found in Kerala.
 III. Tuna fish are rarely caught beyond tropical latitude in the ocean.
 IV. Average temperature exceeds 100°C in thermal springs and hydrothermal vents.
 V. In polar areas and high altitudes temperature goes to 70°C.
 VI. Temperature goes to > 50°C in tropical desert in summer.
 Which of the above statements are false?
 (a) I only (b) II and III only (c) Vonly (d) V and VI only
31. Which of the following accounts for the formation of major biomes?
 (a) Annual variations in intensity of temperature (b) Annual variations in intensity and duration of temperature
 (c) Annual variation in precipitation (d) bandc
32. What are the key elements that lead to so much variation in the physical and chemical conditions of different habitats?
 (a) Temperature and Sight (b) Soil and water
 (c) Only soil (d) Temperature, light, soil and water
33. Basic unit of ecological hierarchy is -
 (a) Ecosystem (b) Community (c) Population (d) Individual

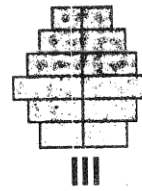
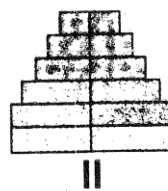
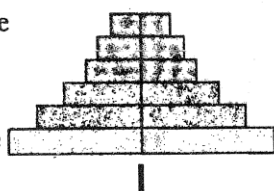
34. A regional ecological unit having a specific climate is -
 (a) Biome (b) Landscape (c) Ecosystem (d) Biotic community
35. Select the false statement -
 (a) Average temperature on land varies seasonally
 (b) Temperature progressively decreases from pole to equator
 (c) Temperature progressively decreases from plains to mountain tops
 (d) Our intestine is a unique habitat for hundreds of species of microbes
36. Which of the following statement is false w.r.t adaptations?
 (a) Many xerophytic plants have thick cuticle on leaf epidermis, sunken stomata
 (b) Some xerophytic plants have special photosynthetic pathway (CAM) that enables their stomata close during day
 (c) *Opuntia* has spines (modified leaves), photosynthetic phylloclade (stem)
 (d) All adaptations are genetically fixed in all organisms
37. Organisms have evolved various mechanisms to maintain homeostasis to perform its physiological and biochemical functions. This can be obtained through -
 (a) Regulation (b) Conformation (c) Migration or suspension (d) All
38. Kangaroo rats -
 (a) Have a generalized diet (b) Avoid eating fats
 (c) Do not need to drink water (d) Are insensitive to heat
39. Find out false one-
 (a) Mammals from colder climate generally have shorter ears and limbs to minimise heat loss
 (b) Some organisms have behavioural adaptations that allow them to respond quickly to a stressful situation
 (c) Some organisms possess adaptations that are physiological which allow them to respond quickly to a stressful situation
 (d) A large variety of invertebrates and fish live at great depths in the ocean where the pressure could be > 100 times than the normal atmospheric pressure
40. Choose the odd one out w.r.t adaptations in the organisms -
 (a) biochemical adaptation are seen in organisms living in great depth of the ocean to face crushing pressure
 (b) Allen's rule is seen in mammals living in colder climates
 (c) Altitude sickness is caused because of body not getting enough oxygen due to low atmospheric pressure at high altitude
 (d) Desert lizards lack the physiological and behavioural means to manage to their body temperature
41. Whales, the world's largest living mammals, live in the ocean, but there are no very small aquatic mammals why?
 (a) They get eaten by larger animals
 (b) They cannot regulate body temperature effectively in water
 (c) Their kidneys cannot handle life in the marine environment
 (d) They lose too much heat from evaporation
42. Elephants use their ears to dump heat to the environment. What mechanisms might they employ to increase heat loss from ears?
 (a) Increased convection due to flapping of the ears (b) Moving into the sun
 (c) Increased blood flow to the ears (d) a and c

43. Choose the odd out w.r.t structure formed in the different organisms during suspended phase.
- Bacteria - Thick walled spores
 - Higher plants - Seeds, vegetative propagules
 - Zooplankton - Diapause stage
 - Ectothermic organisms - Torpid state during favourable season.
44. I. Conformers are the organisms that cannot maintain a constant internal environment.
 II. 99% animals and nearly all plants cannot maintain their constant internal environments
 III. During the course of evolution, the cost and benefits of maintaining a constant internal environment are discarded.
 IV. Conformity is a condition in which an external challenge induces parallel internal changes.
 V. Regulation is a condition in which external challenge elicits compensatory action to maintain the internal milieu.
- All are correct
 - All are wrong
 - Only III is wrong
 - Only IV and V are wrong
45. I. Basking by desert lizards in sun
 II. Hiding in burrows by some animals
 III. Wearing of woolen clothes
 IV. Thermal gaping
 The above are examples of -
- Scansorial adaptation
 - Behavioural adaptation
 - Fossorial adaptation
 - Cursorial adaptation
46. The Kangaroo rat in North American desert do not drink water. How does it survive in such xeric condition.
- Capable of meeting all its water requirements through its internal fat oxidation
 - Its skin is moist
 - Hypertonic urine excretion
 - a and c
47. Which one is correct?
- In a hot climate, reptiles can maintain a constant body temperature in the day by behavioural regulation.
 - The body temperature of thermoconformers changes with ambient temperature.
 - In aquatic osmoconformers, the osmolarity of body fluids changes with that of ambient water.
 - Small animals have a larger surface area relative their volume, they tend to lose body heat very fast when it is cold outside, then they have to expend much energy to generate body heat through metabolism.
- All
 - None
 - Only IV
 - I, II, III
48. Acclimatization (compensatory mechanisms) to altitude sickness includes all except -
- Polycythaemia
 - Hyperventilation
 - Asphyxia
 - Decreasing binding capacity of Mb
49. What does the shape of the given age pyramids (I to III) reflect about the growth status of populations?

Post-reproductive

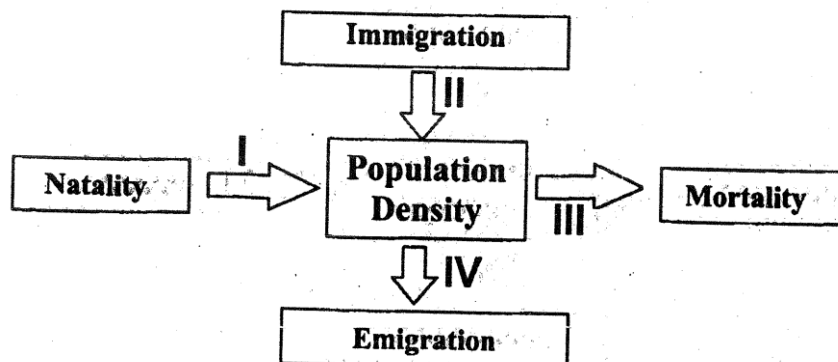
Reproductive

Pre-reproductive



- | | I | II | III |
|-----|-----------|-----------|-----------|
| (a) | Declining | Stable | Expanding |
| (b) | Stable | Expanding | Declining |
| (c) | Expanding | Stable | Declining |
| (d) | Declining | Expanding | Stable |
50. Size of population can be decreased by -
 (a) A higher birth rate (b) Immigration (c) Emigration (d) Increase in food availability
51. If 4 individuals in a laboratory population of 40 fruitflies died during a specific time (a week) interval, the death rate in the population per week is -
 (a) 1 (b) 0.1 (c) 10 (d) 400
52. The reproductive value of an individual is greatest -
 (a) At birth (b) Just before first reproduction
 (c) Halfway through the reproductive stage (d) Just before death
53. Birth rate is 100, death rate is 10. Number of individuals in population group is 1000, What is the percentage of natural growth rate?
 (a) 0.09% (b) 9.0% (c) 0.9% (d) 90%
54. Population density of aquatic animals in some waterbody is measured in term of per -
 (a) m^2 (b) m^4 (c) m (d) m^3
55. The age structure of a population is its -
 (a) Relative number of individuals at each age (b) Number of newborns each year
 (c) Number of a young reaching puberty each year (d) Relative number of deaths at each age
56. Which of the following is false?
 (a) In a population birth rate and death rate refer to per capita births and death respectively
 (b) The size of a population for any species is a static parameter
 (c) In nature, we rarely find isolated, single individuals of any species
 (d) Ecological effects of any factors on a population are generally reflected in its size / population density
57. Which of the following statements is correct?
 (a) Sometimes population density has more impact than the population size, and sometimes vice versa
 (b) The carrying capacity of a habitat always remains the same
 (c) Under normal conditions, births and deaths are the most important factors influencing population density, though other 2 factors (immigration and emigrations) are important in special condition
 (d) a and c
58. Total number of individual of a specific in an area is called -
 (a) Population size (b) Population density (c) Demography (d) Population dynamics
59. If in a pond there are 20 lotus last year and through reproduction 8 new plants are added, taking current population to 28. The birth rate per year is -
 (a) 0.4 (b) 0.8 (c) 2.8 (d) 0.28
60. What four factors define population growth?
 (a) Births; deaths, immigration, emigration
 (b) Survivorship, age-specific mortality, fecundity, death rate
 (c) Mark-recapture, census, quadrat sampling, transects
 (d) Age-specific birth rate, metapopulation structure, quadrat, ecotone

61. Adaptation is an attribute of organisms that enables them to survive and reproduce in their habitats. Adaptation-
(a) May be morphological (b) may be physiological (c) May be behavioural (d) All
62. Keolado National Park (Bharatpur) hosts thousands of migrating birds from Siberia and other extremely cold northern regions. This park is located in -
(a)Gujrat (b) West Bengal (c) Rajasthan (d) Madhya Pradesh
63. Symptoms of altitude sickness include all except -
(a) Nausea (b) Fatigue (c) Heart palpitations (d)Hyperoxia
64. Which of the following is an important adaptation of animals to cold climate -
(a) Thin layer of body fat (b) Aestivation
(c) Increased tendency to shiver (d) Reduced surface area to volume ratio
65. Which of the following is not a factor that would limit the growth of a population?
(a) Food shortage (b) Immigration (c) Disease (d) Weather
66. Parameters related to age structure include -
(a) Fecundity (birth rate) (b) Generation time (c) Death rate (d) All
67. The age distribution of a population is determined by -
(a) Timing of birth (b) Timing of death
(c) The rate at which the population is growing (d) All
68. Population density of terrestrial organism is measured in terms of per -
(a) meter (b) meter² (c) meter³ (d) meter⁴
69. If most individuals in a population are young, why is the population likely to grow rapidly in the future?
(a) Many individuals will begin to reproduce soon (b) Death rates will be low
(c) Immigration and emigration can be ignored (d) The population has a skewed age distribution
70. In an area, there are 200 *Parthenium* and a single huge banyan tree.. Which of the following conclusions is correct?
(a) Population density of banyan is low relative to that of *Parthenium*.
(b) Population cover area of banyan is high relative to *Parthenium*.
(c) In the above case % cover or biomass is a more meaningful measure of the population size.
(d) All the above
71. A population of 100 individuals has a doubling time of 25 years. What size will this population be in 100 years?
(a) 100 (b)400 (c)1600 (d)3200
- 72.



Identify I to IV

	I	II	III	IV
(a)	Increase	Decrease	Increase	Decrease
(b)	Decrease	Increase	Decrease	Increase
(c)	Increase	Increase	Decrease	Decrease
(d)	Decrease	Decrease	Increase	Increase

73. Which is not related to S-shaped population curve?

- (a) Environmental resistance suddenly becomes effective
- (b) Exponential phase is followed by decline phase
- (c) Mass mortality and population crash occurs
- (d) a and c

Biotic potential refers to -

- (a) Increase of population under optimum condition
- (b) Increase of population under given condition
- (c) Increase of population under natural condition
- (d) Increase of population under stress condition

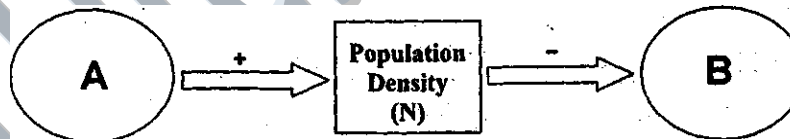
74. Biotic potential refers to -

- (a) Increase of population under optimum condition
- (b) Increase of population under given condition
- (c) Increase of population under natural condition
- (d) Increase of population under stress condition

75. Organisms with very high intrinsic growth rates have -

- (a) Long generation time
- (b) Short generation time
- (c) No carrying capacity
- (d) No courtship behaviours

76. The density of a population in a given habitat during a given period, fluctuates due to changes in four basic processes. On this basis fill up A and B boxes in the given diagram with correct options -



- (a) $A = \text{Nat ty} + \text{Immigration}$, $B = \text{Mort ty} - \text{Emigration}$
- (b) $A = \text{Nat ty} + \text{Mort ty}$, $B = \text{Immigration} + \text{Emigration}$
- (c) $A = \text{Birth rate} + \text{Death rate}$, $B = \text{Migration} + \text{Emigration}$
- (d) $A = \text{Nat ty} + \text{Emigration}$, $B = \text{Mort ty} + \text{Immigration}$

77. Which of the following is correct?

- (a) Natality under actual conditions is called ecological natality
- (b) Ability of an environment to support a population is called carrying capacity
- (c) Plants are killed by frost in winter because of desiccation and mechanical damage
- (d) All

78. Vital index of a population is -

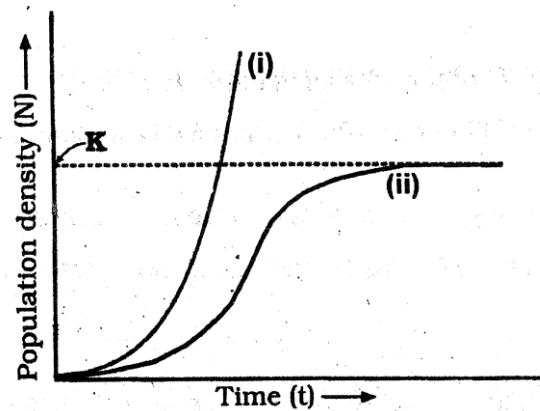
- (a) $(B/D) \times 100$
- (b) $B-D$
- (c) $(D/B) \times 100$
- (d) $B + D$

79. As the number of individuals approaches the carrying capacity of a population, which of the following is predicted by the sigmoidal growth curve?

- (a) Population biomass will remain the same
- (b) Population density will increase exponentially
- (c) Population growth rate will decrease
- (d) Population growth rate will increase

80. Assuming that an animal generates heat at a rate proportional to its volume and can radiate heat at a rate proportional to its body surface area. Which of the following would be best at maintaining its body temperature in a cold climate-
- (a) Mouse (b) Rabbit (c) bear (d) Fox
81. Allen's rule is related to -
- (a) Hibernation (b) Aestivation (c) Migration (d) Evolution
82. Logistic growth occurs when there is -
- (a) Asexual reproduction only (b) Sexual reproduction only
(c) No inhibition from crowding (d) A fixed carrying capacity
83. Exponential growth occurs when there is -
- (a) Asexual reproduction only (b) Sexual reproduction only
(c) No inhibition from crowding (d) A fixed carrying capacity
84. Which of the following can be a limit on population growth?
- (a) Food and water (b) Space (c) Accumulated wastes (d) All
85. A behavioural strategy of adaptation is called echolocation is found in -
- (a) bats (b) Butterfly (c) Praying mantis (d) Arctic tern
86. What is the fate of a population that is dominated by younger individuals and lacking older individuals?
- (a) Growing (b) Declining (c) Becomes highly dynamic (d) Unpredictable
87. An "Urn" shaped population age pyramid represents-
- (a) Growing population (b) Static population (c) Declining population (d) Threatened population
88. Periodic departure and return is known as -
- (a) Migration (b) Immigration (c) Emigration (d) Mutation
89. A population with a larger proportion of older individuals than younger ones will likely-
- (a) Grow larger and then decline
(b) Continue to grow larger indefinitely
(c) Grow smaller and may stabilize at a smaller population size
(d) Not experience a change in population size
90. Which of the following is true for the carrying capacity (K)?
- (a) When $N = K$, the birth rate in a population is zero
(b) The rate of population growth in an unlimited environment is proportional to K
(c) K is always; determined by the amount of food in an environment
(d) In equilibrium at its K the birth rate equals the death rate
91. In a life table, the number of individuals alive at the beginning of the 1-year to 2-year age interval is 800. During this interval 200 individuals die. The death rate for this interval is -
- (a) 0.25 (b) 200 (c) 800 (d) 0.2
92. Go through the population growth formula
- $$\frac{dN}{dt} = rN$$
- Now select the correct option -
- (a) As population gets larger, its rate of growth increases
(b) Represents growth as a continuous process
(c) r is constant and N is variable
(d) All

93. Which of the following is true concerning exponential growth?
- (a) No population can grow exponentially for long.
 - (b) Exponential growth slows down as the population nears its maximal size
 - (c) bacterial colonies have been observed to maintain exponential growth for over a month
 - (d) Exponential growth is commonly observed in large, slow-growing species such as humans and elephants
- The population growth equation describes a population that-
- (a) Grows without limits
 - (b) Grows rapidly at small population sizes, but whose growth rate slows and eventually stops as the population reaches the number the environment can support
 - (c) Rapidly overshoots the number the environment can support and then fluctuates around this number
 - (d) Grows very rapidly and then crashes when the environmental resources are used up
94. Which of these is an explanation of why a population can fluctuate once it has reached carrying capacity?
- (a) The number of organisms decreases but never increases it reaches carrying capacity
 - (b) All populations experience exponential growth once they reach carrying capacity
 - (c) A population of organisms always grow rapidly once it reaches carrying capacity
 - (d) Limiting factors can influence the number of organisms in a population once it reaches carrying capacity
95. The logistic population growth model, $\frac{dN}{dt} = rN \left(1 - \frac{N}{K}\right)$, describes a population's growth when an upper limit to growth is assumed. This upper limit to growth is known as the population's _____, and as N gets larger, $\frac{dN}{dt}$ _____.
- (a) Biotic potential, increases
 - (b) Biotic potential, decreases
 - (c) Carrying capacity, increases
 - (d) Carrying capacity, decreases
96. Choose the correct option-
- (a) Geometric growth produces J-shaped population growth curve
 - (b) Logistic growth occurs when resources are limiting
 - (c) For exponential growth equation is $N_t = N_0 e^{rt}$
 - (d) All
97. Which of the following is false?
- I. The human liver fluke, a nematode parasite, depends on two intermediate hosts (snail and fish) to complete its life cycle.
 - II. The malaria parasite needs a vector (mosquito) to spread to other parasite.
 - III. The female mosquito is not considered parasite, however it needs our blood for reproduction.
 - IV. In case of brood parasitism, the eggs of parasitic birds (e.g. cuckoo) are not detected and ejected from the nest because of parasite's eggs resemble the hosts eggs in morphology and colour.
 - V. A population of frogs protected from all predators would increase indefinitely.
- (a) All
 - (b) None
 - (c) Only III
 - (d) Only V
98. Which one of the following is incorrect?
- (a) Biological control methods adopted in agricultural pest control are based on the ability of the predator to regulate prey population
 - (b) Predators also help in maintaining species diversity in a community by increasing the intensity of competition among competing prey species
 - (c) In the rocky intertidal communities of the American Pacific Coast the starfish *Pisaster* is an important predator.
 - (d) In a field experiment, when all the starfish were removed from an enclosed intertidal area, more than 10



Study the population growth curves shown in the above diagram.

Which options is the best for curve (i) and (ii).

Type of (i) curve	Type of (ii) curve	Status of food & space for curve (i)	Status & space for curve (ii)	Equation for curve (ii)	Equation for curve (i)
(a) Logistic curve	Exponential curve	Unlimited	Limited	$\frac{dN}{dt} = rN$	$\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$
(b) Exponential curve	Logistic curve	Unlimited	Limited	$\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$	$\frac{dN}{dt} = rN$
(c) Logistic curve	Exponential curve	Limited	Unlimited	$\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$	$\frac{dN}{dt} = rN$
(d) Exponential curve	Logistic curve	Limited	Unlimited	$\frac{dN}{dt} = rN$	$\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$

100. Some organisms reproduce only once in their lifetimes because they -

- (a) Invest so much in reproduction that they have insufficient reserves for survival
- (b) Produce so many offspring at one time that they do not need to survive longer
- (c) Do not have enough eggs to reproduce again
- (d) Do not have enough sperm to reproduce again

101. Which one is true?

- (a) Herbivores and plants appear to be more adversely affected by competition than carnivores
- (b) Vice versa
- (c) Both are equal affected
- (d) No relation can be established

102. Carrying capacity for a population is estimated at 500; the population size is currently 400; and $r_{max} = 0.01$. What is dN/dt ?

- (a) 0.01
- (b) 0.8
- (c) 8
- (d) 50

103. Choose the odd one out w.r.t parasitism -

- (a) Parasites show adaptations like loss of digested system and high reproductive capacity.
- (b) Parasite may reduce the survival, growth and reproduction of host.
- (c) Life cycles of ecto parasites are more complex
- (d) Brood parasitism is seen in birds.

104. A population grows rapidly at first and then levels off at carrying capacity of it is -

- (a) Limited by density dependent factors
- (b) Limited by density independent factors
- (c) An opportunistic species ,
- (d) Relatively unaffected by limiting factors

105. Which of the following is correct about host-specific parasites?
- (a) Such parasites can parasitize only a single species of host
 - (b) Both host and parasite tend to co-evolve
 - (c) If host evolves special mechanisms for rejecting the parasite, the parasite has to evolve mechanism counteract and neutralize them to succeed with the host species.
 - (d) All
106. A country that has a stable population is characterized by an age structure that is ____.
- (a) Largest among post-reproductive years
 - (b) Largest among reproductive years
 - (c) About the same among all groups
 - (d) Largest among pre-reproductive years
107. Which one is a physiological adaptation to cold climate?
- I. Small body
 - II. Accumulating glycerol and antifreezing proteins
 - III. Accumulating ice nucleating protein
 - IV. Hibernation
- (a) Only I
 - (b) I, II, III, IV
 - (c) I, II, III
 - (d) I, II, IV
108. Cowbirds lay their eggs in the nests of smaller birds. The fast-developing cowbird chicks hatch first, then push the other baby chicks out of the nest as they hatch. The cowbird is classified as a
- (a) pathogen.
 - (b) parasite.
 - (c) mutualist.
 - (d) victim.
109. The evolution of the animal immune system was probably driven by
- (a) herbivores pushing the animals toward extinction.
 - (b) the selective pressures of parasitic and disease organisms.
 - (c) competition between the animals and their habitats.
 - (d) symbiosis between the animals and their predators.
110. The level of competition between-species depends on
- (a) availability of resources.
 - (b) population density,
 - (c) group interaction of organisms.
 - (d) All of the above
111. Which of the following statements about competition is *false*?
- (a) It can limit the distribution of a species.
 - (b) It can limit the abundance of a species.
 - (c) It can increase the differences between species.
 - (d) It can make two species become more like.
112. Do humans exhibit any mutualistic relationships?
- (a) No, humans form only parasitic relationships with other organisms.
 - (b) No, humans are unable to form mutualistic relationships with other organisms.
 - (c) Yes, between ourselves and the bacteria that make us ill.
 - (d) Yes, between ourselves and the bacteria that live in our guts.
113. Plants that produce fruits are part of a ____ mutualism.
- (a) behavioral
 - (b) seed dispersal
 - (c) gut inhabitant
 - (d) exploitation
114. Consumers can alter which of the following characteristics of victims?
- (a) Distribution
 - (b) Abundance
 - (c) Behavior
 - (d) All of the above
115. Which of the following is not a way a parasite can spend its life?
- (a) Spend part of their life free-living
 - (b) Live entire life within one host
 - (c) Live their life within several hosts
 - (d) Spend their entire life free-living

116. Human cells contain mitochondria, which are responsible for producing the energy needed by our cells. Remember that the ancestors of mitochondria may once have been free-living prokaryotes. If mitochondria were still considered to be separate organisms within our cells, which of the following would best describe our relationship with them?
- (a) Parasitic (b) Mutualistic (c) Competitive (d) Pathogenic
117. An indirect competition for shared resources, such as a particular nutrient, is known as _____ competition,
- (a) exploitation (b) restrictive (c) interference (d) advantageous
118. The evolutionary reason a given organism interacts with another organism is to
- (a) improve the environment in general. (b) make life on Earth easier for humans.
(c) improve its own chance of survival. (d) improve the survival of the organism with which it interacts.
119. When two similar species live in the same area, they may evolve to become more different in order to
- (a) drive the other species to extinction. (b) reduce competition,
(c) use up the other species' resources. (d) reduce genetic variation.
120. Parasitism is an example of a _____ interaction.
- (a) mutualistic (b) consumer-victim (c) victim-victim (d) pollinator dispersal
121. Pathogens are classified as
- (a) victims. (b) pollinators. (c) consumers. (d) mutualists.
122. Which of the following is *not* a form of mutualism?
- (a) Behavioral (b) Pollinator (c) Competitive (d) Seed dispersal
123. Interactions among organisms can have effects at which of the following levels?
- (a) individual (b) Population and Community.
(c) Ecosystem (d) All of the above
124. Human interference has caused ecological imbalances by
- (a) affecting consumer-victim interactions. (b) altering competition between species,
(c) eradicating common parasites. (d) All of the above
125. In lichens, fungus and blue-green algae live together without causing significant harm to one another. Attempts to grow either the algae or the fungi independently result in the death of the organism. This interaction is an example of
- (a) parasitism. (b) mutualism, (c) competition. (d) All of the above
126. If a new predator is introduced to an area with a type of prey that is limited in number, the prey species is likely to
- (a) decrease, and possibly become extinct. (b) increase,
(c) remain stable. (d) initially increase, then decrease.
127. In certain shallow lake of South America, the visiting flamigos and resident fishes compete for _____ as their food,
- (a) phytoplanktons (b) Zooplanktons (c) Smaller fishes (d) Ulothrix

128. Consider a situation where a wasp species feeds on the seeds of a particular tree. During feeding, the wasp helps the tree by transferring pollen from tree to tree (pollination). The relationship between the fig tree and wasps described best encompasses which of the two ecological interactions shown below?

Effects on Organism 1	Effects on Organism 2			
		Benefit	Harm	-No Effect
		Mutualism	Predation	Commensalism
	Harm	Predation or parasitism	Competition	Amensalism
	No Effect	Commensalism	Amensalism	

- (a) Amensalism and predation
(b) Mutualism and predation
(c) Mutualism and commensalism
(d) Mutualism and competition
129. The population explosion that occurred shortly after the prickly pear cactus (opuntia) introduced to Australia in early 1920's is an example of-
- (a) Exponential growth
(b) Emigration
(c) A native species outcompeting an introduced species
(d) Immigration
130. Which of the following is the example of biological control?
- (a) Control of mosquitoes by DDT.
(b) Control of opuntia by a predator (moth), a type of insect.
(c) Decreasing the carrying capacity of the habitat by poisoning it.
(d) rescue effect.
131. You never see cattle or goats browsing on weed calotropis. Why?
- (a) The plant produces highly poisonous tannins
(b) The plant produces quinine which is bitter in taste
(c) The plant produces poisonous cardiac glycosides
(d) The plant produces a chemical which makes the animals away from plant
132. What percentage of all insects is known to be phytophagous?
- (a) Nearly 75% (b) Nearly 25% (c) Nearly 2% (d) Nearly 90%
133. What is the type of ecological relationship that can involve either members of the same species or different species and in-which both participants are harmed?
- (a) Mutualism (b) Parasitism (c) Competition (d) Amensalism
134. Which of the following is not an example of a defence used by plants against herbivores?
- (a) Production of caffeine, tannin, quinine.
(b) More production of non-woody tissues
(c) Production of hairs, thorns, spines
(d) Production of hormone-like chemicals that interfere with insect metamorphosis.
135. According to Darwin which of the following is a potent force in organic evolution?
- (a) intraspecific competition (b) Interspecific competition
(c) Mutation (d) Gene transfer
136. Two organisms that use the same resources when those sources are in short supply are said to be -
- (a) Predators (b) Competitors (c) Mutualists (d) Amensals

137. I. Some species of insects and frogs are cryptically-coloured (Camouflaged).
 II. Some animals are poisonous.
 III. Some animals (e.g. monarch butterfly) are distasteful due to having certain chemical in their bodies.
 The above adaptations are against -
 (a) Predation (b) Mimicry (c) Symbiosis (d) Protection
138. For the defence against predators, butterflies become highly distasteful due to having certain chemical in their bodies. What is the source of the chemical?
 (a) The butterfly has genes for synthesis of this chemical in its each and every cell.
 (b) The butterfly acquires this chemical during its caterpillar stage by feeding on a poisonous plant
 (c) This chemical accumulates in the cells of butterfly when it feeds sap of a plant
 (d) The butterfly synthesises and secretes the chemical from its corpus allatum.
139. Predators are important for a natural ecosystem because they-
 I. Keep prey population under control.
 II. Help in maintaining species diversity.
 III. Are used in biological control method.
 IV. They reduce intensity of competition among competing prey species.
 (a) I, III, IV (b) I, II, III (c) I, II, III, IV (d) I, II, IV
140. No predator becomes proficient at acquiring prey because -
 (a) Predators are too large to be fast enough
 (b) Prey populations evolve more rapidly than predator population
 (c) Predators are not as intelligent as their prey
 (d) Prey populations evolve antipredatory traits
141. Match the Column I with Column II -
- | | Column I | Column II |
|------|---------------------------|-----------------------|
| I. | Endothermic animals | A. Angler fish |
| II. | Ectothermic animals | B. Mammals |
| III. | Organisms of benthic zone | C. Amphibia, reptiles |
- | | I | II | III |
|-----|---|----|-----|
| (a) | A | B | C |
| (b) | C | B | A |
| (c) | B | C | A |
| (d) | A | C | B |
142. Community is—
 (a) Group of independent, interesting populations of same species.
 (b) Group of independent and interacting populations of same species in specific area.
 (c) Group of independent and interacting populations of different species in a specific area.
 (d) Group of independent and interacting populations of different species.
143. The fitness of one species (measured in terms of its 'r', the intrinsic rate of increase) is significantly lower in the presence of another species.
 The above phenomenon refers to -
 (a) Competition (b) Symbiosis (c) Commensalism (d) Protocooperation

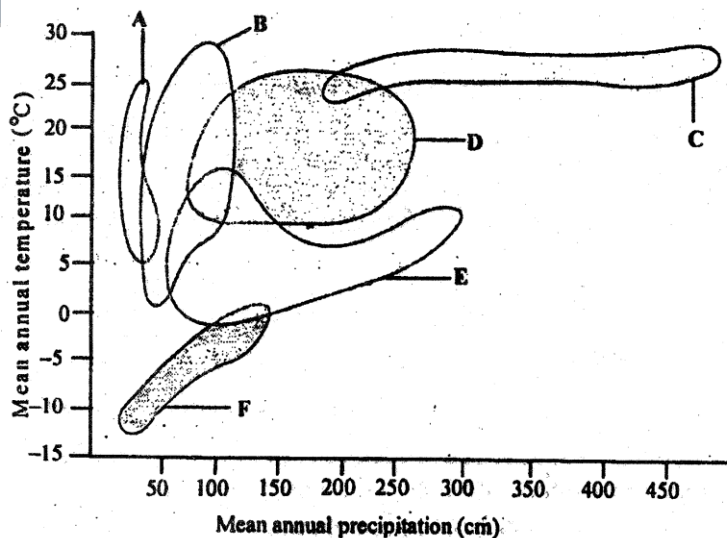
144. Competition for light, nutrients and space is most severe between-
- Closely related organisms growing in different niches
 - Closely related organisms growing in the same area / niche
 - Distantly related organisms growing in the same habitat
 - Distantly related organisms growing in different niches
145. Find out the false one?
- The barnacle *Chthamalus* has a larger niche when *Balanus* is absent.
 - The niches of the two barnacles are not the same in intertidal zone
 - The presence or absence of each species affects the niche of the other
 - None
146. In small isolated tribal population-
- Wrestlers pass down the trait of strong muscles to the progeny
 - There is no change in population size due to large gene pool
 - There is decline in population as boys marry girls only of their tribe
 - Hereditary diseases like colour blindness do not spread
147. Which ecological unit or relationship is least related to abiotic factors?
- Community
 - Symbiosis
 - Population
 - Ecosystem
148. A bird introduced from another country became a serious pest due to-
- Better adaptation to new area
 - More sexual reproduction
 - Better nesting habitats
 - Absence of natural competition
149. When resources are limited, the competitively superior species eventually eliminate the other species. It is relatively-
- Easy to demonstrate it in natural condition
 - Easy to demonstrate it in laboratory experiments
 - Easy to demonstrate it in both natural condition and laboratory experiments
 - Difficult to demonstrate it in both natural condition and laboratory experiments
150. Two species of barnacles vie for space in the intertidal zone. The one that remains is -
- The better competitor
 - Better adapted to the area
 - a and b
 - The better predator
151. Connell's elegant field experiments are related to -
- Paramecium
 - Barnacles
 - Viruses
 - protozoans
152. The spread of opuntia was controlled by -
- Allowing cattle to graze over it
 - Allowing sheep and goats to browse over it
 - Introducing insect
 - Spraying herbicide
153. The overall role of an organism in its environment is called a(n) ____.
- Carrying capacity
 - Ecological niche
 - Ecological succession
 - Ecological destiny
154. The interaction between smaller barnacle *Chthamalus* and larger barnacle *Balanus* in intertidal zone is -
- Mutualism
 - Competition
 - Parasitism
 - Amensalism
155. Population dynamics is related to -
- Increase in population
 - Decrease in population
 - Change in population
 - All of the above

156. Term homeostasis in an ecosystem refers to-
- (a) Self regulatory mechanism
 - (b) Feed back mechanism
 - (c) Influence of productivity
 - (d) State of equilibrium
157. At asymptote stage, the population is -
- (a) Stabilised
 - (b) Increasing
 - (c) Decreasing
 - (d) Changing
158. Resource partitioning includes-
- (a) Temporal partitioning (different times for feeding)
 - (b) Spatial partitioning
 - (c) Morphological differentiation (using a resources in different ways)
 - (d) All
159. Commensalism is the interaction in which one species benefits and the other is neither harmed nor benefitted. Which of the following is the example of commensalism?
- (a) Epiphyte / Orchid on mango branch
 - (b) Cattle egret and grazing cattle
 - (c) Sea anemone and clown fish
 - (d) All
160. An example of species-specific coevolution is -
- (a) Yucca plants and the single species of moth that pollinates them
 - (b) Fig species and its pollinating species of wasp
 - (c) Both a and b
 - (d) *Hydrilla* and its pollinating agent
161. Through resource partitioning-
- (a) Two species can compete for the same prey
 - (b) Slight variation in niche allow closely related species to co-exist in the same habitat
 - (c) Competitive exclusion results in the success of the superior species
 - (d) Two species undergo character 'displacement that allows them to compete
162. A female fig wasp enters the syconium of a fig, pollinates the flowers, and lays eggs in the ovaries of some of the flowers. The young larvae grow up, eat (and kill) some, but not all, of the seeds, and complete their life cycle. The fig is completely dependent on fig wasps to pollinate its flowers, and the fig wasp requires figs to complete its life cycle. The interaction between figs and fig wasps has aspects of
- (a) mutualism.
 - (b) competition
 - (c) predator-prey and host-parasite interaction.
 - (d) a and c
163. Which of the following is correct?
- (a) Two species may not live in the same habitat
 - (b) The more dissimilar the niches of two species, the stronger is their competition
 - (c) No two species can occupy exactly the same niche in the geographical area
 - (d) No two species may occupy the same ecosystem
164. The most spectacular and evolutionary fascinating examples of mutualism is found in -
- (a) Bacteria - animals relationship
 - (b) Algae-Animals relationship
 - (c) E coli-Colon relationship
 - (d) Plants-Animal relationship
165. What does competitive exclusion theory state?
- (a) Two closely related species competing for the same resources cannot co-exist indefinitely and competitively inferior one will be eliminated eventually
 - (b) Humans are the most widespread agents of disturbance
 - (c) In a competition for similar resource both the participants are benefitted
 - (d) In a competition, both the participants are excluded

166. Which of the following was not usually observed by G.F. Gause in his studies on interspecific competition?
 (a) Species usually had higher growth rate when alone
 (b) Some species that grew very rapidly in a particular environment would be completely eliminated when grown with other species
 (c) Populations grow exponentially when alone
 (d) None of the above
167. An example of species - Specific coevolution is certain plant species and the single species of animal that pollinates the plant. This type beneficial system is the safeguard against-
 (a) Pathogenic fungi (b) Pollen or nectar robbers / cheaters
 (c) Pathogenic microbes (d) All
168. Consider the following statements (A)-(D) each with one or two blanks.
 A. Bears go into (1) during winter to (2) cold weather.
 B. A conical age pyramid with a broad base represents (3) human zopulation.
 C. A wasp pollinating a fig flower is an example of (4)
 D. An area with high levels of species richness is known as (5)
 Which one of the following options, gives the correct fit! upsfor the respective blank numbers from (1) to (5) in the statements?
 (a) (3) - stable (4) - commens sm, (5) marsh
 (b) (1) - aestivation, (2) - escape, (3) - stable, (4) - mutu sm
 (c) (3)-expanding, (4) - commens sm, (5)-biodiversity park
 (d) (1) - hibernation, (2) - escape, (3) - expanding, (4) Mutualism , (5) hot spot
169. The birth and death rates of four countries are given below. Which one will have the least population growth rate?

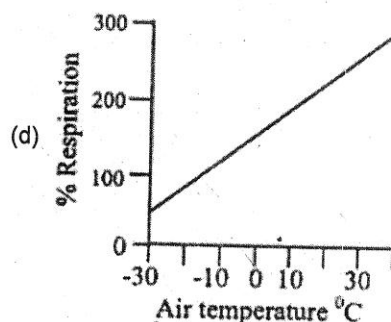
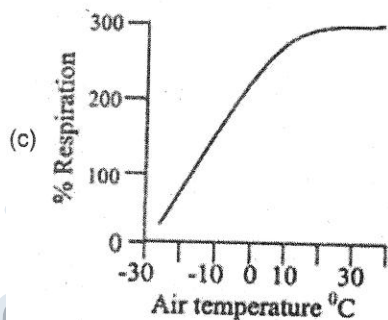
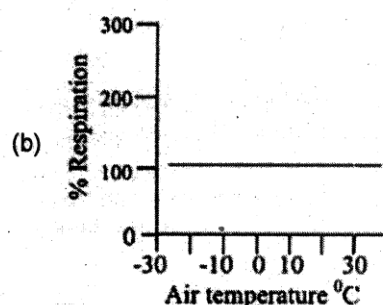
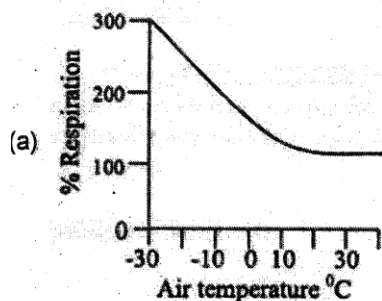
Country	Birth rate/ 1000	Death/ 1000
M	15	5
N	25	10
O	35	18
P	48	41

- (a)M (b)N (c)O (d)P
170. A species whose distribution is restricted to small geographical area due to the presence of a comparatively superior species, expands its distribution when the competing species is experimentally removed. This phenomenon is called-
 (a) Competitive exclusion (b) Family history, occupation (c) Competitive arrival (d) Appearance, physiology
171. In the given figure, identify the temperate forest and coniferous forest from the markings A—F and select the correct nation.



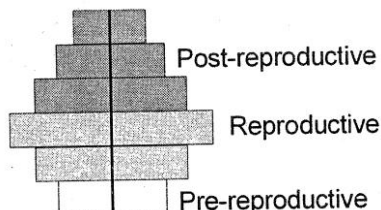
- (a)A;&B (b)B&D (c) D & E (d)C&F

172. Ecologists say that a niche is like a species __ ____, while habitat is like its _____.
 (a) Occupation, address, (b) Competitive release
 (c) Education, occupation (d) Interference competition
173. A population growth becomes asymptote when population density
 (a) Crosses carrying capacity (b) Is in lag phase
 (c) Is in log phase (d) Reaches carrying capacity
174. Consider the following four conditions (a - d) and select the correct pair of them as adaptation to environment in *desert lizards*.
 A. Burrowing in soil to escape high temperature
 B. Losing heat rapidly from the body during high temperature
 C. Bask in sun when temperature is low
 D. Insulating body due to thick fatty dermis
 (a) (A), (B) (b) (C), (D) (c) (A), (C) (d) (B), (D)
175. Which of the following graphs correctly depicts the rate of respiration of a non-hibernating mammal living in cold climate?



176. Most living organisms cannot survive at temperature above 45°C. How are some microbes able to live in habitats with temperature exceeding 100°C?
 (a) Occurrence of branched chains of lipids reducing fluidity of cell membrane
 (b) Reduction in amount of free water
 (c) Development of heat tolerant enzymes
 (d) All
177. If a population grow exponentially doubles in size in 3 years, what is the intrinsic rate of increase (r) of the population-
 (a) 25.94% (b) 80% (c) 100% (d) 10%

178. What type of human population is represented by the adjacent pyramid?



- (a) Expanding population (b) Vanishing population (c) Stable population (d) Declining population
179. Laige Woody Vines are more commonly found in
 (a) Alpine forests (b) Temperate forests (c) Mangroves (d) Tropical rainforests

180. Natural selection operates at
(a) Species level (b) Population level (c) Individual level (d) Community level
181. Which one of the following is categorised as a parasite in true sense?
(a) The cuckoo (koel) lays its egg in crow's nest
(b) The female Anopheles bites and sucks blood from humans
(c) Human foetus developing inside the uterus draws nourishment from the mother
(d) Head fouse living on the human scalp as well as laying eggs on human hair
182. In growth pattern, $(1 - N/K)$ is
(a) Carrying capacity (b) Intrinsic rate of natural increase
(c) Environmental resistance (d) Biotic potential
183. The interaction is detrimental to both the species, in
(a) Predation (b) Commensal (c) Amensal (d) Competition
184. Verhulst-Pearl logistic growth pattern is
(a) Sigmoid (b) J-shaped (c) Straight line (d) Hyperbola
185. The association between clown fish and sea anemone is the same as between
(a) Egret and grazing cattle (b) Cuckoo and crow (c) Fig and wasp (d) Cuscuta and hedge plant
186. What are "large undisturbed areas where wild life is protected in its natural habitat"?
(a) Biosphere reserves (b) National parks (c) Sacred landscapes (d) Wildlife sanctuaries
187. The animals that rely on the heat from environment than metabolism to raise their body temperature are, in strict sense, called
(a) ectothermic (b) poikilothermic (c) homeothermic (d) endothermic.
188. Which of the following is most appropriately defined?
(a) Host is an organism which provides food to another organism
(b) Amensal is a relationship in which one species is benefited whereas the other is unaffected
(c) Predator is an organism that catches and kills other organism for food
(d) Parasite is an organism which always lives inside the body of other organism and may kill it
189. A biologist studies the population of rats in a barn. He found that the average natality was 250, average mortality 240, immigration 20 and emigration 30. The net increased in population is-
(a) 15 (b) 05 (c) Zero (d) 10
190. When the value of 'r' is significantly low as compared to another species: it is better known by
(a) Competition exclusion (b) Interference competition (c) Resource partition (d) Competitive release

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	c	d	c	d	c	d	a	d	b	a	c	c	a	d	a	c	b	d	a	d
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	d	d	c	d	a	b	c	d	a	c	d	d	d	a	b	d	d	c	b	d
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	b	d	d	c	b	d	a	c	c	c	b	b	a	d	a	b	d	a	a	a
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	a	c	d	d	b	d	d	b	a	d	c	c	d	a	b	a	d	a	c	c
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	d	d	c	d	a	a	c	a	c	d	a	d	a	d	d	d	d	b	a	a
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	a	b	c	a	d	c	c	b	b	d	d	c	b	a	d	b	a	c	b	b
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	c	c	d	d	b	a	b	b	a	b	c	b	c	b	b	b	a	b	d	d
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	c	c	a	b	d	c	b	d	b	c	b	c	b	d	d	a	d	d	d	c
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	b	d	c	d	a	d	b	d	d	b	c	a	d	c	a	d	a	d	d	b
Ques.	181	182	183	184	185	186	187	188	189	190										
Ans.	d	c	d	a	a	a	a	c	c	b										

1. The gas that is removed from the atmosphere by plants and algae is
 (a) nitrogen. (b) oxygen. (c) carbon dioxide. (d) methane.
2. Carbon cycles relatively rapidly except when it is
 (a) dissolved in freshwater ecosystems. (b) released by respiration.
 (c) converted into sugars. (d) stored in petroleum, coal, or wood.
3. In the past 150 years there has been a major new input to the carbon cycle. What is it?
 (a) There are more humans releasing large quantities of carbon dioxide as respiration.
 (b) Increased animal farming has resulted in greater carbon dioxide releases.
 (c) Industrialization has resulted in the burning of fossil fuels such as oil and coal, which releases carbon dioxide into the atmosphere.
 (d) Changes in ocean currents have led to the release of large quantities of carbon dioxide
4. In succession, _____ is a crucial factor.
 (a) Time (b) Direction (c) Height (d) Space
5. A rat feeding on potato tuber is—
 (a) Carnivore (b) Decomposer (c) Producer (d) Primary consumer
6. What do primary producers have available to convert into biomass?
 (a) 10% of secondary productivity (b) energy used for respiration
 (c) gross primary productivity (d) net primary productivity
7. Productivity in terrestrial ecosystems is affected by
 (a) temperature. (b) light intensity,
 (c) availability of nutrients and water. (d) all of the above.
8. Which of the following organisms and trophic levels is mismatched?
 (a) algae—producer (b) phytoplankton—primary consumer
 (c) fungi—detritivore (d) bobcat—secondary consumer
8. The open ocean and tropical rain forest are the two largest contributors to Earth's net primary productivity because
 (a) both have high rates of net primary productivity.
 (b) both cover huge surface areas of the Earth.
 (c) nutrients cycle fastest in these two ecosystems.
 (d) the ocean covers a huge surface area and the tropical rain forest has a high rate of productivity.
10. Which of the following is not true of a pyramid of productivity?
 (a) Only about 10% of the energy in one trophic level is passed into the next level.
 (b) Because of the loss of energy at each trophic level, most food chains are limited to three to five steps.
 (c) The pyramid of productivity of some aquatic ecosystems is inverted because of the large zooplankton primary-consumer level
 (d) Eating grain-fed beef is an inefficient means of obtaining the energy trapped by photosynthesis

11. Nitrogen is often in short supply in terrestrial ecosystems. Why?
- (a) There is very little free nitrogen in the air.
 - (b) Atmospheric nitrogen is primarily in the stratosphere and does not come into contact with terrestrial ecosystems.
 - (c) Atmospheric nitrogen cannot be used by most organisms. It needs to be converted to useful forms by bacteria and cyanobacteria.
 - (d) Nitrogen solubility in water is very low and therefore atmospheric nitrogen enters cells very slowly.
12. Primary productivity
- (a) is equal to the standing crop of an ecosystem.
 - (b) is greatest in freshwater ecosystems.
 - (c) is the rate of conversion of light to chemical energy in an ecosystem.
 - (d) is inverted in some aquatic ecosystems.
13. Which of the following trophic levels would have the largest numbers of individuals?
- (a) primary producers
 - (b) omnivores
 - (c) primary consumers
 - (d) opportunistic feeders
14. In an ecosystem, bacteria are considered as-
- (a) Microconsumers
 - (b) Macroconsumers
 - (c) Primary consumers
 - (d) Secondary consumers
15. Frog that feeds an insect is-
- (a) Primary consumer
 - (b) Secondary consumer
 - (c) Tertiary consumer
 - (d) Decomposer
16. The nature's cleaners are-
- (a) Producers
 - (b) Consumers
 - (c) Decomposer and scavenger
 - (d) Symbionts
17. Density and distribution of the plant and animal species vary along-
- (a) Stratification
 - (b) Succession
 - (c) Gradation
 - (d) Zonation
18. In an ecosystem,
- (a) energy is recycled through the trophic structure.
 - (b) energy is usually captured from sunlight by primary producers, passed to secondary producers in the form of organic compounds, and lost to detritivores in the form of heat.
 - (c) chemicals are recycled between the biotic and abiotic sectors, whereas energy makes a one-way trip through the food web.
 - (d) there is a continuous process by which energy is lost as heat, and chemical elements leave the ecosystem through runoff
19. Chemosynthetic bacteria found around deep-sea vents are examples of
- (a) producers.
 - (b) decomposers.
 - (c) chemical cycling.
 - (d) secondary productivity
20. Photosynthesis and respiration are central to which cycle?
- (a) The nitrogen cycle
 - (b) The carbon cycle
 - (c) The phosphorus cycle
 - (d) The sulfur cycle
21. Most of Earth's nitrogen is in
- (a) the atmosphere.
 - (b) the oceans.
 - (c) fresh water.
 - (d) soil.
22. Most of the world's carbon is found
- (a) as carbon dioxide in the atmosphere.
 - (b) in living organisms.
 - (c) as bicarbonate and carbonate ions dissolved in the oceans.
 - (d) as carbonate minerals in sedimentary rock.

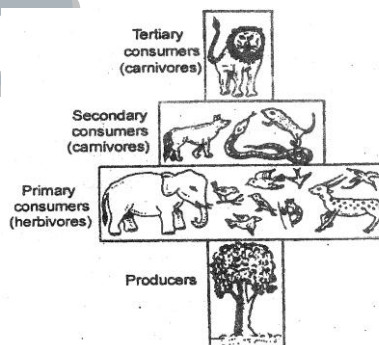
23. Which of these processes is incorrectly paired with its description?
- (a) nitrification—oxidation of ammonium in the soil to nitrite and nitrate
 - (b) nitrogen fixation—reduction of atmospheric nitrogen into ammonia
 - (c) denitrification—removal of nitrogen from organic compounds
 - (d) ammonification—decomposition of organic compounds into ammonia
24. Secondary productivity
- (a) is measured by the standing crop.
 - (b) is the rate of biomass production in consumers,
 - (c) is greater than primary productivity.
 - (d) is 10% less than primary productivity.
25. Biogeochemical cycles are global for elements
- (a) that are found in the atmosphere.
 - (b) that are found mainly in the soil,
 - (c) such as carbon, nitrogen, and phosphorus.
 - (d) that are dissolved in water.
26. Stratification in more common is-
- (a) Deciduous forest
 - (b) Tropical rain forest
 - (c) Temperate forest
 - (d) Tropical savannah
27. Deer in a forest ecosystem acts as-
- (a) Primary consumer
 - (b) Secondary consumer
 - (c) Decomposer
 - (d) None
28. Which of the following biogeochemical cycles has a major reservoir in sedimentary rock?
- (a) Carbon cycle
 - (b) Nitrogen cycle
 - (c) Phosphorus cycle / Sulfur cycle
 - (d) More than one cycle
29. In biogeochemical cycles, elements that cycle fastest
- (a) are found in organisms.
 - (b) are scarce.
 - (c) have a gaseous phase.
 - (d) do not become fixed into sediment.
30. Black soil is due to the presence in it of-
- (a) Air
 - (b) Minerals
 - (c) More Moisture
 - (d) Organic matter
31. Which of the following statements regarding the hydrological cycle is false?
- (a) Most input to the oceans occurs via runoff from rivers.
 - (b) More water evaporates from the surface of the oceans than falls as rain over the oceans.
 - (c) Less water evaporates from the surface of the land than falls as rain over the land.
 - (d) Water found in sedimentary rock is constantly exchanged with the ocean.
32. Which of the following always has a "pyramidal" shape, that is, decreasing values at higher trophic levels?
- (a) Pyramids of numbers only
 - (b) Pyramids of biomass only
 - (c) Pyramids of energy only
 - (d) Both pyramids of biomass and pyramids of energy
33. Which of the following could not be considered an ecosystem?
- (a) A small pond
 - (b) All the fish in a coral reef
 - (c) Earth
 - (d) A pile of dung in a pasture
34. Which of the following is not an objective of integrated pest management?
- (a) To eliminate the use of chemicals in agriculture
 - (b) To develop pest-resistant strains
 - (c) To use natural biological control methods
 - (d) To reduce agriculturally-caused pollution
35. Water logging occurs in-
- (a) Sandy soil
 - (b) Gravel soil
 - (c) Loamy soil
 - (d) Clay soil
36. Green plants constitute-
- (a) 1st Trophic level
 - (b) 2nd trophic level
 - (c) 3rd trophic level
 - (d) 4th trophic level

37. Grasslands can support greater grazing rates by herbivores than forests because
- grasslands receive more sunlight.
 - the net production of grasslands is greater.
 - grasslands produce less woody plant tissue.
 - more of the grassland production is above ground.
- (d) Energy used to excite a chlorophyll electron
38. Which of the following statements about food chains and energy flow through ecosystems is false?
- A single organism can feed at several trophic levels.
 - The lower the trophic level at which an organism feeds, the more energy is available.
 - Detritivores feed at all trophic levels except the producer level.
 - Food webs include two or more food chains.
39. What is true about photolithotrophs ?
- Obtain energy from radiations and hydrogen from organic compounds
 - Obtain energy from radiations and hydrogen from inorganic compounds
 - Obtain energy from organic compounds
 - Obtain energy from inorganic compounds
40. Which of the following biogeochemical cycles is characterized by a major reservoir that is gaseous, and a major inorganic form that can only be utilized by a small group of bacteria and cyanobacteria?
- Carbon cycle
 - Nitrogen cycle
 - Phosphorus cycle
 - Sulfur cycle
41. On average, how much of the energy assimilated at one trophic level is converted to production at the next trophic level (excluding the conversion of sun-light into chemical energy by plants)?
- 5 - 20%
 - Less than 1 %
 - 20 - 30%
 - 30 - 50%
42. A plant in the dark uses 0.02 ml of O₂ per minute. The same plant in sunlight releases 0.14 ml of O₂ per minute. A correct estimate of its rate of gross primary production is
- 0.02 ml of O per minute,
 - 0.12 ml of O₂ per minute.
 - 0.14 ml of O₂ per minute.
 - 0.16 ml of O₂ per minute.
43. Which of the following biogeochemical cycles has a gaseous phase released by volcanoes and fumaroles?
- Carbon cycle
 - Nitrogen cycle
 - Phosphorus cycle
 - Sulfur cycle
44. An inverted pyramid of _____ may occasionally be observed in _____ communities.
- energy, grassland
 - energy, forest
 - biomass, marine
 - biomass, grassland
45. In light, a plant fixes 0.12ml of CO₂ per hour, however, in the dark the same plant releases 0.04 ml of CO₂ per hour. What is the estimated net primary production of this plant?
- 0.04 ml/hour
 - 0.08 ml/hour
 - 0.12 ml/hour
 - 0.16 ml/hour
46. Which of the environment is richest in free oxygen?
- Salt water
 - Atmosphere
 - Warm fresh water
 - Cold Fresh water
47. The large carnivores such as lion, tiger, which cannot be preyed upon further are called-
- Predator
 - Organolithotroph
 - Top Coninore
 - Omnivore
48. The phosphorus cycle differs from the carbon cycle in that
- phosphorus does not enter living organisms, whereas carbon does.
 - the phosphorus cycle does not include a gaseous phase, whereas the carbon cycle does.
 - the phosphorus cycle includes a solid phase, whereas the carbon cycle does not.
 - the primary reservoir of the phosphorus cycle is the atmosphere, whereas the primary reservoir for the carbon cycle is in rock.

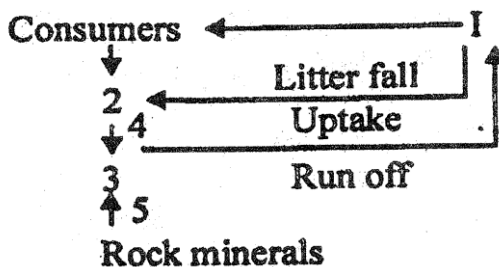
49. Which of the following changes would not result in an increase in net primary production?
- (a) Increased precipitation in an area
 - (b) Increased soil fertility
 - (c) Increased latitude (moving from the equator toward the poles)
 - (d) Moving down a mountain to warmer temperatures
50. Which of the following biogeochemical cycles is characterized by a form which is a major greenhouse gas?
- (a) Carbon cycle
 - (b) Nitrogen cycle
 - (c) Phosphorus cycle
 - (d) Sulfur cycle
51. Which of the following biogeochemical cycles lacks a gaseous phase?
- (a) Carbon cycle
 - (b) Nitrogen cycle
 - (c) Phosphorus cycle
 - (d) Sulfur cycle
52. Which of the following is not a part of either gross or net primary production in plants?
- (a) Light reflected from the leaf
 - (b) Energy fixed into glucose
 - (c) Energy expended in moving material through membranes
53. After nutrient input into a lake is reduced, the time required for the lake to return to pre-eutrophication conditions depends on
- (a) the rate of turnover of its waters.
 - (b) the presence of the appropriate algae-eating fish,
 - (c) whether there is a thermocline in the lake.
 - (d) the amount of groundwater reaching the lake.
54. Which of the following statements regarding the movement of energy and nutrients through ecosystems is true?
- (a) Energy flows and nutrients flow.
 - (b) Energy flows and nutrients cycle,
 - (c) Energy cycles and nutrients cycle.
 - (d) Energy cycles and nutrients flow.
55. In the human-induced condition called eutrophication, the main biogeochemical cycle that is altered is the _____ cycle, and the effect is to create _____ conditions and decrease species diversity..
- (a) hydrological, aerobic
 - (b) phosphorus, anaerobic
 - (c) hydrological, aerobic
 - (d) phosphorus, aerobic
56. The pyramid of energy is always upright for any ecosystem. This situation indicates the fact that -
- (a) Producers have the lowest energy conversion efficiency
 - (b) Carnivores have a better energy conversion efficiency than herbivores
 - (c) Energy conversion efficiency is the same in all trophic
 - (d) Herbivores have a better energy conversion efficiency than carnivores
57. Which of the following statements about biogeochemical cycles is false?
- (a) Carbon and nitrogen cycle faster than phosphorus.
 - (b) All biogeochemical cycles include both organisms and nonliving components.
 - (c) Most elements remain longest in the living portion of their cycle.
 - (d) You may have atoms in your body that were once part of a dinosaur.
58. _____ is the only life containing region of the atmosphere.
- (a) Mesosphere
 - (b) Exosphere
 - (c) Thermosphere
 - (d) Troposphere
59. The amount of energy reaching an upper trophic level is determined by
- (a) net primary production.
 - (b) net primary production and the efficiencies with which food energy is converted to biomass.
 - (c) gross primary production.
 - (d) gross primary production and the efficiencies with which food energy is converted to biomass.

60. In a food chain, the maximum population is that-
 (a) Produces (b) Primary Consumers (c) Secondary consumers (d) Tertiary consumers
61. Termite is a-
 (a) Detrivore (b) Decomposer (c) Saprotroph (d) All of these
62. Which of the following is true about the amount of sunlight and heat arriving on Earth?
 (a) Every place on Earth receives the same annual number of hours of sunlight and the same amount of heat.
 (b) Every place on Earth receives the same annual number of hours of sunlight, but not the same amount of heat.
 (c) Every place on Earth receives the same annual amount of heat, but not the same number of hours of sunlight.
 (d) Both the annual amount of sunlight and the amount of heat received vary over the surface of Earth.
63. Which of the following statements about biogeochemical cycles is not true?
 (a) Most elements remain longest in the living portion of their cycle.
 (b) Gaseous elements cycle more quickly than elements without a gaseous phase.
 (c) You may have some atoms in your body that were once part of a dinosaur.
 (d) Biogeochemical cycles all include both organismal and nonliving components.

64. The given figure best represents -
 (a) Pyramid of number in parasitic food chain
 (b) Pyramid of biomass in forest ecosystem
 (c) Pyramid of number in grassland ecosystem
 (d) Pyramid of number in forest ecosystem



65. The energy transferred from one trophic level to another is-
 (a) 5% (b) 10% (c) 5% (d) 20%
66. The total amount of energy that plants assimilate by photosynthesis is called
 (a) gross primary production, (b) net primary production, (c) biomass. (d) a pyramid of energy.
67. In which of the following compartments of the global ecosystem would circulation of materials be affected by Earth's revolution around the sun?
 (a) Oceans (b) Fresh waters (c) Atmosphere (d) All of the above
68. Fill in the blanks, in the following simplified model of a nutrient cycle.



- | | 1 | 2 | 3 | 4 | 5 |
|-----|-----------|---------------|---------------|---------------|---------------|
| (a) | Producers | Detritus | Soil solution | Decomposition | Weathering |
| (b) | Producers | Detritus | Soil solution | Weathering | Decomposition |
| (c) | Producers | Soil solution | Detritus | Decomposition | Weathering |
| (d) | Producers | Soil solution | Detritus | Weathering | Decomposition |

69. Secondary producers are
 (a) Herbivores (b) Producers (c) Carnivores (d) None
70. The transfer of energy in food chain is
 (a) Bidirectional (b) Unidirectional (c) Multi-directional (d) Reversible.
71. A vegetarian food habits of man help in getting
 (a) Less energy than non-vegetarian (b) More energy than non-vegetarian
 (c) Some amount of energy as in non-vegetarian
 (d) More or less same energy as non-vegetarian but depending upon the type of food taken.
72. Second most important trophic level in a lake is
 (a) Phytoplankton (b) Zooplankton (c) Benthos (d) Fishes.
73. Percentage of nitrogen in air is about
 (a) 78% (b) 69% (c) 21% (d) 0.03-0.03%
74. In a forest ecosystem/green plants are
 (a) Primary producers (b) Primary consumers (c) Consumers (d) Decomposers
75. Which is correct sequence in the food chain?
 (a) Grass → Wolf → Deer → Buffalo (b) Bacteria → Grass → Rabbit → Wolf
 (c) Grass → insect → Bird → Snake (d) Grass → Snake → insect → Deer.
76. A pond is
 (a) A biome (b) A natural ecosystem
 (c) An artificial ecosystem (d) A community of plants and animals only.
77. In an ecosystem, the population of
 (a) Primary producer is greater than primary consumers
 (b) Secondary consumers is largest
 (c) Primary consumers outnumber primary
 (d) Primary consumer is least dependent upon primary producers.
78. In a food chain, herbivores are
 (a) Primary consumers (b) Primary producers (c) Secondary consumers (d) Decomposers.
79. The secondary productivity means
 (a) Rate of increase in the biomass of autotrophs
 (b) Rate of increase in the biomass of heterotrophs
 (c) The rate at which the organic molecules are formed in an autotroph
 (d) The rate at which organic molecules are used up by an autotroph.
80. Which one of the following has the largest population in a food chain?
 (a) Producers (b) Primary consumers (c) Secondary consumers (d) Decomposers.
81. Total number of living material at the various trophic levels of a food chain is depicted by pyramids of-
 (a) Number (b) Energy (c) Biomass (d) All of the above
82. Nepenthes is a-
 (a) Primary producer (b) Consumer
 (c) Saprophyte (d) Primary producer and consumer
83. Strong winds with intermediate duration are termed-
 (a) Storm (b) Typhoon (c) Gusts (d) Squall

84. When a big fish eats a small fish which eats water fleas supported by phytoplankton, the water fleas are :
 (a) Producer (b) Primary consumers
 (c) Secondary consumers (d) Top consumer in this food chain.
85. Graphic representation of biomass relationship between the producer and the consumers is called
 (a) Ecological system (b) Ecological niche (c) Ecological pyramid (d) Trophic level
86. When a peacock eats snakes which eats insects thriving on green plants, the peacock is
 (a) A primary consumer (b) A primary decomposer
 (c) A final decomposer (d) The apex of the food pyramid.
87. The correct definition of ecosystem is
 (a) A community of organisms interacting with one another
 (b) The biotic components of an area
 (c) That part of the earth and its atmosphere which is inhabited by living organisms
 (d) A community of organisms together with the environment in which they live.
88. Which of the following process helps in nutrient conservation?
 (a) Mineralization (b) Immobilization (c) Leaching (d) Nitrification.
89. Which of the following is a most stable ecosystem?
 (a) Forest (b) Desert (c) Mountain (d)
90. Which of the following is an abiotic component of the ecosystem?
 (a) Bacteria (b) Humus (c) Plants (d) Fungi.
91. Which of the food chain will be advantageous in terms of energy ?
 (a) Plants → Man
 (b) Plants → Goat → Man
 (c) Plants → Mice → Snakes → Hawk
 (d) Plants → Grasshopper → Insects → Frog → Snake → Hawk.
92. A food chain consists of-
 (a) Producer only (b) Producer and consumer (c) Consumers (d) Decomposers.
93. Ecosystem has two components
 (a) Plants and animals (b) Weeds and trees (c) Biotic and abiotic (d) Frogs and man.
94. Ecological niche refers to
 (a) Habitat (b) Microhabitat
 (c) Habitat and its relationship (d) Habitat and climate.
95. Intensive planting of trees to increase forest cover is-
 (a) Afforestation (b) Agro-Foresting (c) Deforestation (d) Social forestry
96. Forest area in India is about-
 (a) 9% of geographical area (b) 19% of geographical area
 (c) 29% of geographical area (d) 37% of geographical area
97. The gaseous portion of outer earth surface is
 (a) Hydrosphere (b) Atmosphere (c) Lithosphere (d) Biotic component
98. Photic zone lies upto the depth of
 (a) 10M (b) 100M (c) 150M (d) 200M
99. Which of the following biome has largest number of species?
 (a) Taiga (b) Tropical forest (c) Deciduous forest (d) Chaparral.






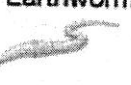


100. Which of the following represents the sedimentary type of nutrient cycle?
 (a) Nitrogen (b) Carbon (c) Phosphorus (d) Oxygen.
101. Mild grazing in grasslands by herbivores-
 (a) Retards growth of grasses (b) Destroys regetation
 (c) Amests growth of grasses (d) Stimulates growth of grasses
102. Soil fertility in reduced by-
 (a) Nitrogen fixing bacteria (b) Decaying organic matter
 (c) Crop rotation (d) Intensive agriculture
103. Water-logged soil in-
 (a) Physically wet but physiologically day (b) Physically as well as physiologically
 (c) Physically as well as physiologically day (d) Physically day
104. Primary productivity depends upon -
 A. the plant species inhabiting a particular area B. availability of nutrients
 C. photosynthetic capacity of plants D. none
105. Arrange the following ecosystems in increasing order of mean NPP (Tonnes / ha / year)
 A. Tropical deciduous forest
 B. Temperate coniferous forest
 C. Tropical rain forest
 D. Temperate deciduous forest
 (a) B<A<D<C (b) D<B<A<C (c) A<C<D<B (d) B<D<A<C
106. Which is correct?
 (a) primary succession occurs faster than secondary succession.
 (b) secondary succession occurs faster than primary succession
 (c) primary and secondary succession occur at the same rate
 (d) none
107. Which of the following is/are incorrect -
 A. All ecosystems are constant in size
 B. In nature food chains exist, not food web
 C. flow of energy in ecosystem is linear
 D. Gene flow occurs between 2 different population (of 2 species)
 (a) A,C (b) A,D (c) A, B..P (d) A, B, C,D
108. **Column I** **Column II**
 I. Phosphorus (A) Atmosphere
 II. Carbon (B) Producers
 III. Goat (C) Rock
 IV. Grasses (D) T₂
 (a) I- C, II- B, III-D, IV-A (b) I- C, II- A, III-D, IV-B
 (c) I- A, II- C, III-B, IV-D (d) I- B, II-C, III-D, IV-A
109. A. The amount of living matter (biomass) present at every trophical level is called standing crop.
 B. Saprophytes are not given any in ecological pyramids.
 C. Ecological pyramid does not account the same species belonging to two or more trophic levels.
 D. Humus is reservoir of nutrients,
 (a) All are correct (b) All are incorrect (c) Only D is correct (d) A, D and C are correct

110. Food chain starts with -
 (a) Respiration (b) Photosynthesis (c) N₂-fixation (d) None
111. Autotrophs are-
 (a) T₁ (b) T₂ (c) T₃ (d) T₄
112. **Column I** **Column II**
 I. Presence of 3-4 storey of plant crowns in a forest (A) B. G. A.
 II. A biome having grasses with scattered trees (B) Stratification
 III. Man made ecosystem (C) Savannah
 IV. Pioneer in Hydrosere (D) Dam
 (a) I- C, II- B, III-D, IV-A (b) I- C, II- A, III-D, IV-B
 (c) I-A, II- C, III-B, IV-D (d) I- B, II-C, III-D, IV-A
113. A dynamic equilibrium is established between community and environment when-
 (a) climax is attained (b) pioneers are found
 (c) serai communities are growing (d) none
114. **Column I** **Column II**
 I. Pioneer community on lithosphere (A) Crustose lichens
 II. Ecological succession (B) Mesophytes
 III. Climax community (C) Ecosystem development
 IV. Ecological pyramid (D) Elton
 (a) I- C, II- B, III-D, IV-A (b) I- C, II- A, III-D, IV-B
 (c) I- A, II- C, III-B, IV-D (d) I- B, II-C, III-D, IV-A
115. Which of the following include(s) ecosystem services -
 A. purification of air and water by forests B. forests mitigate droughts and flood
 C. forests act as store house of carbon D. forests influence hydrological cycle
 (a) A, C (b) A, D (c) A, B, C (d) A, B, C, D
116. Which of the following ecological pyramids may be upright or inverted?
 A. pyramid of energy B. pyramid of number C. pyramid of biomass D. none
 (a) A, C (b) B, C (c) A, B, C (d) A, B, C, D
117. Which of following is / are trend (s) in ecological succession
 A. an increase in complexity of species
 B. an increase in productivity
 C. an increase in community stability and species diversity
 D. a decrease in nonliving organic materials.
 (a) A, C (b) A, D (c) A, B, C (d) A, B, C, D
118. Which is / are true regarding ecosystem?
 A. self sufficient unit
 B. cyclic exchange of materials between living beings and environment
 C. only requirement is input of energy
 D. characterized by a major vegetation type
 (a) A, C (b) A, D (c) A, B, C (d) A, B, C, D

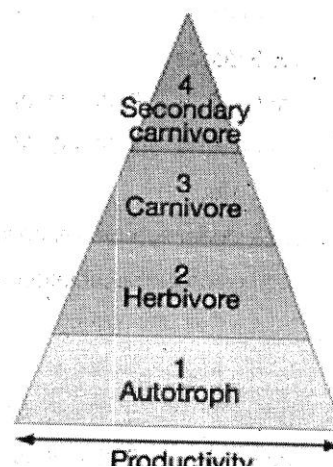
119. Which of the following factors influence communities-
- A. Climate
B. Species interaction
C. feeding relationships among organisms
D. succession
- (a)A, C (b)A,D (c)A, B, C (d)A, B,C, D
120. Causes of succession include-
- A. climatic change B. one species altering the environment for the next species
C. different species dispersal mechanism D. None
- (a)A,C (b)A, D (c)A, B, C (d)D
- (a)A,C (b)A,D (c)A, B, C (d)D
121. The phosphates remain outside the natural cycle for a long time -
- (a) When they form compounds with metals
(b) When they are incorporated in bone and teeth
(c) When the bodies of the organisms excrete and decompose
(d) Both (a) and(b)
122. **Column I** **Column II**
- I. Primary succession (A) Autotrophs
II. Climax community (B) Community that has completed succession
III. Consumer (C) Colonization of a new environment.
IV. Producer (D) Animals
- (a) I- C, II- B, III-D, IV-A (b)I- C,II- A, III-D, IV-B
(c)I- A, II- C, III-B, IV-D (d)I- B, II-C, III-D, IV-A
123. Ecological succession is-
- (a) directional but unpredictable (b) directionless but predictable
(c) directional and predictable (d) directionless and unpredictable
124. Herbivores are -
- (a) Primary consumer (b) T₃
(c) T₂ (d) Primary consumers or T₂ or Consumer of 1 st order.
125. Succession is a -
- (a) long term process (b) very fast process
(c) process leading the development of a population (d) migration
126. Selects the incorrect statement(s) -
- A. The factors affecting decomposition are chemical nature of detritus and the climatic factors.
B. It detritus is rich in lignin and chitin decomposition is very fast
C. Decomposition is very slow if the detritus is rich in nitrogen
D. Detritus is the raw material for decomposition
- (a)A,C (b)A,D (c)A,B,C (d)A,B,C,D
127. Which of the following statement(s) is / are correct about biogeochemical cycle -
- A. Carbon and nitrogen cycle faster than phosphorus cycle
B. All biogeochemical cycles include both organisms and nonliving components
C. Most elements remain longest in the living portion of their cycle
D. The chemical elements used by organisms in large quantities cycle back and forth between organisms and environment.
- (a)A,C (b)A,B, D (c)A, B, C (d)A,B,C, D

128. A food chain consists of -
 A. 1° producers B. secondary producers C. consumers D. none
 (a) A, C (b) A, D (c) A, B, C (d) D
129. Food chains differ from food webs in that -
 A. food chains are a single sequence of who eats whom in a community.
 B. food chains better represent the entire community.
 C. food webs represent the complex interaction among food chain.
 D. food chain is the flow of energy in a population
 (a) A, C (b) A, D (c) A, B, C (d) A, B, C, D
130. An ecosystem which can be easily damaged but recover after some time if damaging effect stops will be having -
 A. high stability B. low stability C. high resistance D. low resistance
 (a) A, C (b) A, D (c) A, B, C (d) A, B, C, D
131. Which of the following are artificial aquatic ecosystems?
 A. large dams and reservoirs B. lakes and canals C. fishery tanks and aquaria D. none
132. The term used to describe all the species and physical factor at a site is the-
 (a) ecology (b) habitat (c) ecosystem (d) community
133. The amount of energy that is left to build bodies is termed -
 (a) gross productivity (b) net productivity (c) total productivity (d) respiratory loss
134. Which of the following is the least source of renewable energy ?
 (a) Petroleum (b) Forests (c) Coal (d) Cattle
135. Which of the following is NOT a reason why productivity declines from one trophic level to the next?
 (a) Energy is converted into tissue by many trophic levels.
 (b) Some of the energy stored in the chemical bonds of reduced carbon compounds is lost as heat as it is metabolized.
 (c) Carnivores never consume many herbivores because they hide effectively or sequester toxins.
 (d) Much of the net primary productivity is unavailable to herbivores.
136. Using the figure, determine which animals would be found in the same trophic level.

A. Trophic levels

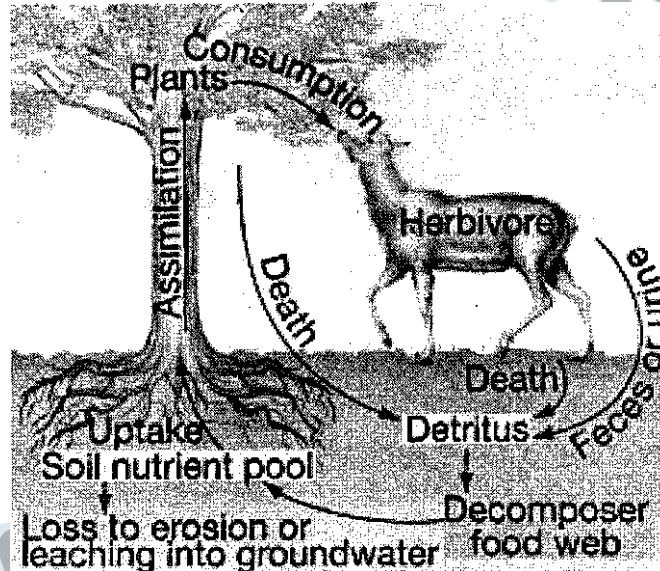
Trophic level	Feeding strategy	Grazing food chain	Decomposer food chain
4	Secondary carnivore	Cooper's hawk 	Owl 
3	Carnivore	Robin 	Shrew 
2	Herbivore	Cricket 	Earthworm 
1	Autotroph	Maple tree leaves 	Dead maple leaves 

B. Pyramid of productivity



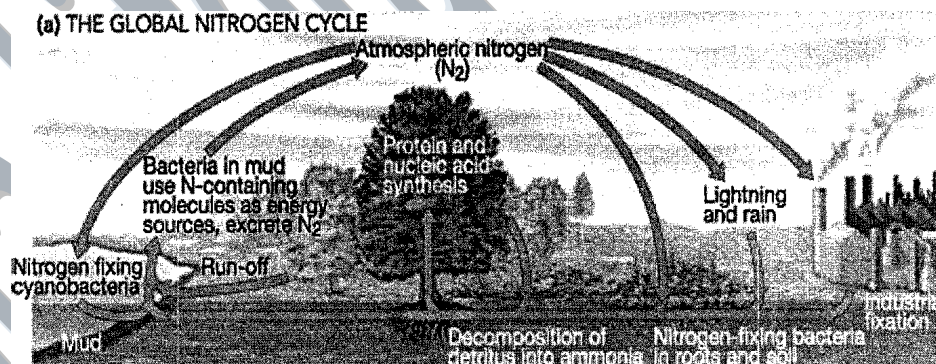
- (a) humans and horses (b) eagles and blue jays
 (c) pine trees and garden snakes (d) crickets and cows

137. Why are changes in the global carbon cycle important?
- (a) Less atmospheric carbon means that there are less fossil fuels available.
 - (b) Changes to the global carbon cycle cause changes in the global nitrogen cycle, as well.
 - (c) More atmospheric carbon dioxide means that there is less carbon available for the growth of terrestrial plants.
 - (d) Carbon dioxide functions as a greenhouse gas.
138. Using the figure, which of the following is NOT true of the biogeochemical cycle?



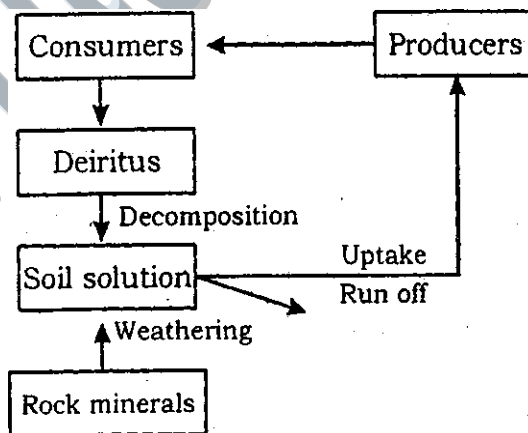
- (a) Nutrients are taken up from the soil by plants and incorporated into plant tissue.
 - (b) Nutrients pass to animal members of the ecosystem once plants are eaten.
 - (c) If the plant dies, the nutrients and the plant biomass become litter.
 - (d) Nutrients remain in an animal until the animal's death.
139. Which of the following is NOT true of a food web?
- (a) The overall average number of trophic levels found in a food web is about 3.5.
 - (b) It describes the species occupying each trophic level in a particular ecosystem.
 - (c) As energy is transferred through the food chain, a lot of it is lost.
 - (d) Several species can be present in each trophic level of a food web.
140. Several of the major human impacts are farming, logging, burning, and soil erosion. They all result in accelerated nutrient loss by what common mechanism?
- (a) soil compaction
 - (b) environmental pollution
 - (c) vegetation removal
 - (d) loss of animal habitat
141. Which of the following is true of net primary production?
- (a) Deserts and arctic regions have the highest productivity.
 - (b) There is no productivity in the depths of the oceans.
 - (c) Marine productivity is highest along coasts and in areas where water wells up from the ocean bottom to the surface.
 - (d) Temperate areas are more productive than tropical areas.
142. Which of the following is NOT a hypothesis for why food-chain length is limited?
- (a) Food-chain length is limited by one organism's ability to consume another.
 - (b) Food-chain length is limited because they are easily disrupted by environmental perturbations.
 - (c) Food-chain length is limited by productivity.
 - (d) Food-chain length is a function of an ecosystem's physical structure.

143. In a comparative study of grassland ecosystem and pond ecosystem it may be observed that -
 (a) The biotic components are almost similar (b) The abiotic components are almost similar
 (c) Primary and secondary consumers are similar (d) Both biotic and abiotic components are different
144. Which of the following is NOT a basic aspect of biogeochemical cycling?
 (a) the nature and size of the pools or reservoirs where elements are stored for a period of time
 (b) how different biogeochemical cycles interact
 (c) how energy flows through an ecosystem
 (d) the rate of movement between pools and the factors that influence these rates
145. Source of energy which does not produce CO₂ is-
 (a) Oil (b) Coal (c) Nuclear energy (d) Organic compounds
146. Which of the following is false?
 I. Quantity of biomass in a trophical level at a particular period is called standing crop.
 II. The energy content in a trophical level is determined by considering a few individuals of a species in that trophical level.
 III. The succession that occurs in nearly cooled lava is called primary succession.
 IV. Rate of succession is faster in the secondary succession
 V. Phytoplanktons are the pioneers in aquatic succession
 (a) Only II (b) Only III (c) Only V (d) Only I and IV
147. Which of the following is NOT part of the natural nitrogen cycle?



- (a) decomposition (b) lightning (c) biological fixation (d) fossil fuels
148. With which of four levels of biological organisation Ecology is basically concerned?
 A. Organisms B. Species C. Family
 D. Population E. Community F. Biomass
 (a) A, B, C, D (b) A, C, D, E (c) A, D, E, F (d) B, D, E, F
149. Which of the following statements are correct?
 A. Detritivores break down detritus into smaller particles. This process is called fragmentation.
 B. By the process of leaching, water soluble inorganic nutrients go down into the soil horizon and get precipitated as unavailable salts.
 C. Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called catabolism.
 (a) A, B, C (b) A, B (c) B, C (d) A, C

150. Two similar Halophytes are called-
 (a) Isotype (b) Neotype (c) Synotype (d) Mesotype
151. In trophic level of our ecosystem we belong to-
 (a) Secondary consumer and fourth trophic level (b) Secondary consumer and 3rd trophic level
 (c) Tertiary consumer and 3rd trophic level (d) Tertiary consumer and fourth trophic level
152. The component of the ecosystem are seen to function as a unit when you consider which of the following aspects
 A. Productivity B. Decomposition C. Energy flow D. Nutrient cycle
 (a) B, C, D (b) A, B, C (c) A, B (d) A only
153. The free floating organism of an open sea and sea shores are collectively called-
 (a) Plankton (b) Nektons (c) Benthonic (d) None
154. Which of the following is correct?
 (a) Decomposition is largely an oxygen non-requiring process.
 (b) The rate of decomposition is controlled by chemical composition of detritus and climate factors
 (c) In particular climatic condition, decomposition rate is faster if detritus is rich in lignin and chitin and decomposition is slower if detritus is rich in nitrogen and water-soluble substances like sugars.
 (d) Temperature and soil moisture are the least important climatic factor that regulate, decomposition through their effect on the activities of soil microbes¹
155. Desert can be converted into green and land by pasting -
 (a) Oxylophytes (b) Psammophytes (c) Halophytes (d) Tropical trees
156. Dead plant remains such as leaves, bark, flowers and dead remains of animals, including fecal matter constitutes
 (a) Detritus (b) Duff (c) Solonchak (d) Humus
157. Represents -



- (a) Carbon cycle (b) N₂ cycle (c) O₂ cycle (d) Phosphorus cycle
158. The amount of biomass or organic matter produced per unit area over a time period by plants during photosynthesis is called primary production, which is expressed as
 (a) g⁻² (b) kcal fr⁻² (c) (kcal mrr²) yr⁻¹ (d) Both (a) & (b).
159. Match the following -
- | Column I | Column II |
|---|--|
| A. Standing state . | (i) Perfect |
| B. Gaseous cycles | (ii) Amount of nutrients |
| C. Standing crop | (iii) Imperfect |
| D. Sedimentary cycles | (iv) Living matter at different trophic levels |
| (a) A- (ii), B - (i), C - (iv), D - (iii) | (b) A- (i), B - (ii), C - (iii), D - (iv) |
| (c) A- (iii), B - (ii), C - (iv), D - (i) | (d) A- (i), B - (iv), C - (iii), D - (ii) |

160. Represents -



- (a) Pyramid of number in, tree ecosystem (b) Pyramid of biomass in tree ecosystem
(c) Pyramid of biomass in sea ecosystem (d) Pyramid of number in sea ecosystem

161. Parmacelia and peltigera are-

- (a) Foliose lichens (b) Custose lichens (c) Fruticose lichens (d) Moss

162. Which of the following statements regarding decomposition is false?

- I. Warm and moist favours decomposition.
II. Decomposition rate is slower if detritus is rich in chitin and lignin.
III. Earthworm is detritus.
IV. Precipitation of soluble inorganic nutrients in the soil horizon as unavailable salt is called miner zation.
V. Detritus is the raw material for decomposition.
(a) Only II (b) Only I (c) Only IV (d) Only V

163. Which of the following represents an incomplete ecosystem?

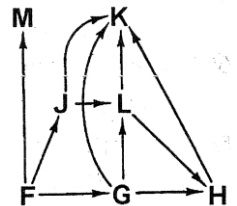
- (a) Small pond, forest lake (b) Tree ecosystem, Estuaries
(c) Agricultural ecosystem, kitchen-garden (d) Rain water pond, sea bottom

164. Organisms which are associated with first as well as third trophic level are

- (a) Macrophytes (b) Phytoplanktons (c) Chemoautotrophs (d) Insectivorous plants
(d)G

165. Which species is (a) decomposer?

- (a)F
(b)G
(c)H
(d)K



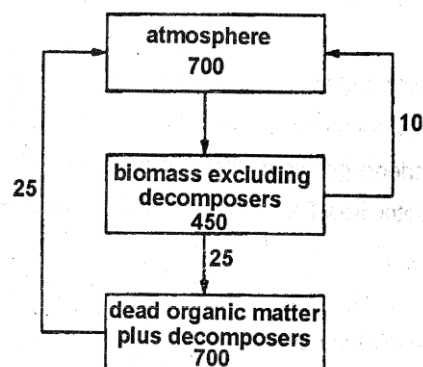
166. Which of the following most often limits the rate at which nutrients move through an ecosystem?

- (a) species composition (b) decomposition rate (c) primary production (d) none of the above

167. Licher us the pioneer vegetation in which type of succession-

- (a) Hydrosere (b) Lithosere (c) Psammosere (d) Xesosere

168. The diagram shows estimated values for carbon fixation in a terrestrial ecosystem. Figures refer to tonnes $\times 10^9$, fixed or available for fixation.



Which conclusion can be drawn from the diagram?

- (a) There is a net gain to the producers.
- (b) The system is in balance.
- (c) There is a net loss to the atmosphere.
- (d) There is a net loss to the decomposers.

169. Productivity at the second trophic level is always

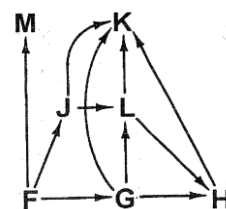
- (a) greater than the productivity at the first trophic level
- (b) less than the productivity at the first trophic level
- (c) equal to the productivity at the first trophic level
- (d) extremely variable compared to the productivity at the first trophic level

170. The overall productivity in terrestrial ecosystems is limited by

- (a) temperature
- (b) water
- (c) sunlight
- (d) a combination of the above

171. The diagram below shows a particular food web. Each letter represents a different species. Arrows indicate the flow of energy and materials. Which of the following would probably have the greatest total biomass?

- (a) (b)J + G
- (c)K
- (d) K + M

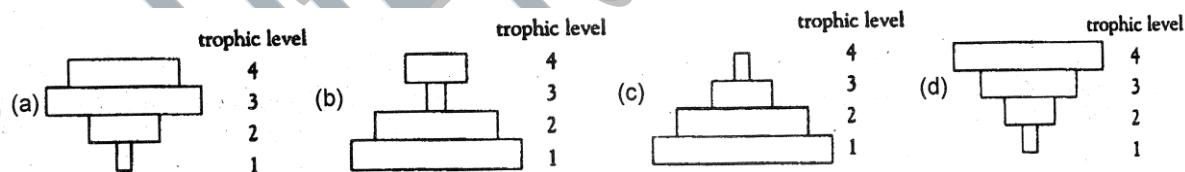


172. Two food chains are shown.

tree → aphid → insectivorous bird → bird of prey

phytoplankton → zooplankton → plankton-feeding fish → carnivorous fish

Which diagram is a pyramid of energy representing both food chains?



173. Which one of the following animals may occupy more than one trophic levels in the same ecosystem at the same time?

- (a) Sparrow
- (b) Lion
- (c) Goat
- (d) Frog

174. Bacterial role in carbon cycle is-

- (a) Chemosynthesis
- (b) Photosynthesis
- (c) Breakdown of organic matter
- (d) None of these

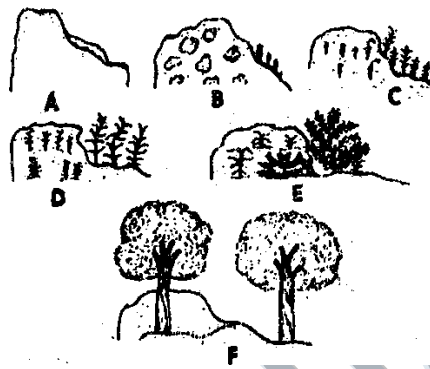
175. Perturbation of which of the following cycles contributes most to global warming?

- (a) the global carbon cycle
- (b) the global water cycle
- (c) the global nitrogen cycle
- (d) All of these cycles contribute equally.

176. The path that an element takes as it moves from abiotic systems through living organisms and back again is referred to as its

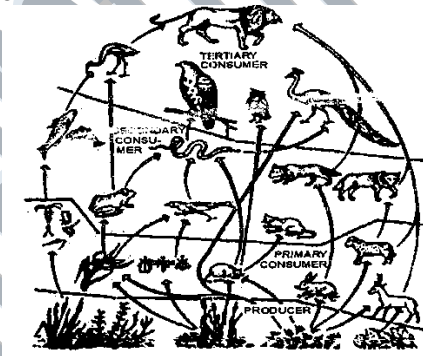
- (a) biogeochemical cycle
- (b) biological cycle
- (c) nutrient cycle
- (d) geochemical cycle

177. The given figure represents the biotic succession on bare rock (lithosere). At which stage(s) (as labelled A-F) will you find plants like Solidago, Festuca.

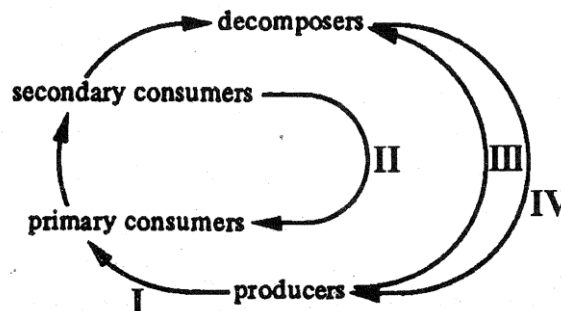


- (a) stage C (b) stage D (c) stage D & E (d) stage E

178. An ecological pyramid of biomass is the representation of the ecosystem's
 (a) energy flow through each trophic level (b) population in each food web
 (c) tissue organisation at each trophic level. (d) all of these.
179. Which one has always a steeper vertical gradient?
 (a) pyramid of mass (b) pyramid of energy
 (c) pyramid of numbers (d) pyramid of energy in aquatic ecosystem
180. What is correct for the diagram given?

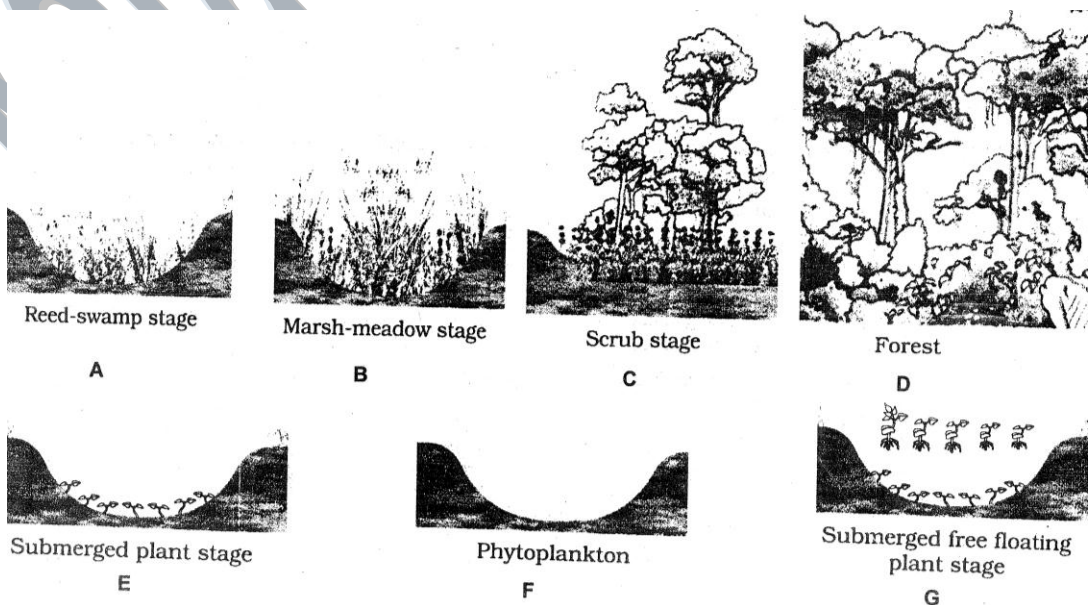


- (a) It represents a food chain
 (b) It could be accommodated by ecological pyramid
 (c) Several types of organisms are available at each trophic level
 (d) From producers to top carnivores, biomass always increases 1.
181. The problem(s) with the notion that if all humans became vegetarians, then the earth could support more people is that
 (a) some land is suitable only for grazing, not raising grains.
 (b) humans require supplemental protein, which often comes from dairy products, in their diets.
 (c) without population stabilization, humans would eventually use up all the agricultural land anyway.
 (d) all of the above are true.
182. The diagram below shows the flow of materials between trophic levels. Which arrow is incorrect?



- (a) I (b) II (c) III (d) IV

183. Of the five elements that are the most important constituents of living things, the only one that requires the action of microorganisms to enter the living system is
 (a) carbon. (b) hydrogen. (c) oxygen. (d) nitrogen.
184. Which one is inverted pyramid?
 (a) pyramid of biomass in grassland (b) Pyramid of biomass in pond ecosystem
 (c) pyramid of numbers in grassland ecosystem (d) pyramid of energy in a pond ecosystem.
185. Which one of the following is not used for construction of ecological pyramids?
 (a) fresh weight (b) dry weight (c) number of individuals (d) rate of energy flow
186. Pyramid of numbers in grassland ecosystem is
 (a) linear (b) upright (c) inverted (d) negative.
187. Tip of an ecological pyramid is occupied by -
 (a) Producers (b) Herbivores (c) Carnivores (d) None of the above
188. In most food chains,
 (a) there are fewer individuals at the top predator level than at the second trophic level.
 (b) there is less usable energy at the herbivore level than at the carnivore level.
 (c) there are few individuals at the decomposer level.
 (d) there is less usable energy at the auto-trophic level than at the carnivore level.
189. Relationships in an ecosystem can be depicted through
 (a) pyramid of energy (b) pyramid of biomass (c) pyramid of numbers (d) all the above.
190. Which one of the following regarding ecological pyramid is not correct?
 (a) In most ecosystems, the pyramid of numbers and biomass are upright
 (b) In tree-dominated ecosystem the pyramid of numbers is inverted
 (c) The pyramid of energy expresses mainly the rate of food production
 (d) In deep water ecosystem, the pyramid of biomass is upright
191. Mr. X is eating yoghurt. For this he is occupying the trophic level -
 (a) First (b) Second (c) Third (d) Fourth
192. Following are the different stages in primary succession in water body.



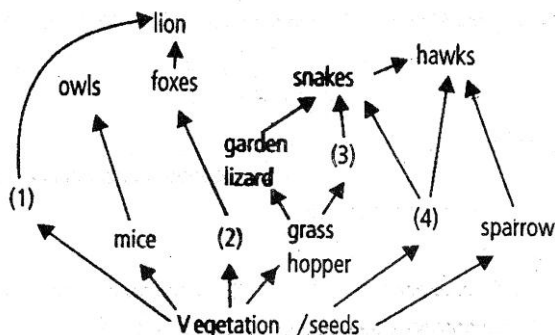
The correct sequence of stages is-

- (a) F - E - G - A - B - C - D (b) A - C - E - G - B - D - F (c) A - G - F - B - C - D - E (d) G - F - E - D - C - B - A

193. Which of the following is called as a detritivore?
 (a) an animal feeding on decaying organic matter (b) an animal feeding on a plant
 (c) a plant feeding on an animal (d) an animal feeding on another animal.
194. In a pyramid of numbers, in a grassland ecosystem, the largest population is that of
 (a) producers (b) tertiary consumers (c) secondary consumers (d) primary consumers.
195. The breakdown of detritus into smaller particles by earthworm is a process called -
 (a) Humification (b) Fragmentation (c) Miner sation (d) Catabolism
196. In autogenic succession
 (a) early and continued dominance of autotrophic organism takes place like green plants
 (b) replacement of existing communities cause largely by any other external condition
 (c) early dominance of heterotrophs takes place such as bacteria, fungi and other animals
 (d) community itself modifies its own environment thus causing its own replacement by new communities.
197. If a pyramid of number, representing an ecosystem of a large fresh water pond, the number of primary consumers is
 (a) more than the producers (b) less than .the tertiary consumers
 (c) more than the secondary cbnsumers (d) less than the secondary consumers.
198. The most energy-efficient method to feedJarge human populations such as in China is to eat:
 (a) mostly rice and vegetables with little meat
 (b) large amounts of meat with few vegetables
 (c) large amounts of fish with little rice
 (d)None
199. Which of the following statements is false?
 I. Pyramids of energy and yearly biomass production can never be inverted, since this would violate the laws of thermodynamics.
 II. Pyramids of standing crop and numbers can be inverted, since the amount of organisms at any one time does not indicate the amount of energy flowing through the system.
 III. There are certain limitations of ecological pyramids such as it does not take into account the same species belonging to two or more trophic levels.
 IV. Saprophytes are not given any place in ecological pyramids even though they play a vital role in the ecosystem,
 (a) I and II (b) III and IV (c)All (d)None
200. The correct sequence of plants in a hydrosere is
 (a) Volvox → Hydrilla →» Pistia →» Scirpus →» Lantana →» Oak
 (b) Pistia → Volvox → Scipus →» Hydrilla →» Oak →» Lantana
 (c) Oak →» Lantana →» Volvox →» Hydrilla →» Pistia →» Scitpus
 (d) Oak →» Lantana →» Scirpus →» Pistia →» Hydrilla →» Volvox.
201. In the process of ecological succession, organisms that are present at one stage change
 (a) the environment in some way
 (b) from abiotic to biotic factors
 (c) from producers to consumers
 (d) the relationship between global warming and natural disturbances

202. The bacteria which attack dead animals are
 (a) first link of the food chain and are known as primary producers.
 (b) second link of the food chain and are herbivorous
 (c) third link of the food chain and are tertiary consumers
 (d) the end of food chain and are decomposers.
203. The four main processes of the water cycle are
 (a) evaporation, transpiration, condensation, and vaporization
 (b) precipitation, condensation, transpiration, and evaporation
 (c) transpiration, evaporation, precipitation, and vaporization
 (d) condensation, vaporization, precipitation, and circulation
204. Animals with a constant body temperature such as mammals and birds require more food than do animals with changing body temperature such as reptiles and fish. Why?
 (a) Much of the food is utilised to produce heat to keep warm
 (b) Warm-blooded animals waste more food than cold-blooded animals
 (c) Cold-blooded animals digest their food more efficiently than warm-blooded animals
 (d) None
205. Which one of the following types of organisms occupy more than one trophic level in a pond ecosystem?
 (a) fish (b) zooplankton (c) frog (d) phytoplankton.
206. In recycling of mineral elements within an ecosystem, the responsible direct causal organism are called
 (a) Decomposers (b) Producers
 (c) Primary consumers (d) Secondary consumers
207. Which one of the following is considered as pioneer community in xerarch?
 (a) annual herb (b) perennial herb (c) shrub stage (d) lichen.
208. Read the following statements carefully.
 (i) Primary succession is a very slow process taking thousands of years for the climax to be reached.
 (ii) Energy at a higher trophic level is always more than at a , lower level.
 (iii) Bacterial and fungal enzymes degrade detritus into simpler inorganic substances. This process is called fragmentation,
 (iv) All succession whether taking place in water or on land, proceeds to a similar climax community — the mesic.
 Which of the two above statements are, correct?
 (a) (i) & (ii) (b) (ii) & (iii) (c) (i) & (iv) (d) (iii) & (iv).
209. Amount of carbon in the environment
 (a) does not change
 (b) is converted to heat and lost to the abiotic environment
 (c) is called the carbon cycle
 (d) immediately converts to carbon dioxide
210. A detritivorous animal of economic importance is
 (a) earthworm (b) giriraja fowl (c) caterpillar larva (d) leech.
211. Consider the following statements concerning food chains.
 (A) Removal of 80% tigers from an area resulted in greatly increased growth of vegetation
 (B) Removal of most of the carnivores resulted in an increased population of deers'
 (C) The length of food chains is generally limited to 3-4 trophic levels due to energy loss
 (D) The length of food chains may vary from 2 to 8 trophic levels.
 Which two of the above statements are correct?
 (a) A,D (b) A,B (c) B, C (d) C, D.

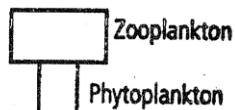
212. Which one of the following ecosystem types has the highest annual net primary productivity?
 (a) tropical deciduous forest (b) temperate evergreen forest
 (c) temperate deciduous forest, (d) tropical rain forest.
213. The free floating organisms of an open sea and the shore are collectively called
 (a) planktons (b) benthos (c) nektons (d) sea anemone.
214. In plant succession when climax is reached the net productivity
 (a) continues to increase (b) becomes halved (c) becomes stable (d) becomes zero
215. Find out the correct order of succession levels in xerarch.
 (a) lichen, moss stage, annual herb stage, perennial herb stage, shrub stage, forest
 (b) annual herb stage, perennial herb stage, lichen, moss stage, shrub stage, forest
 (c) perennial herb stage, annual herb stage, lichen, moss stage, shrub stage, forest
 (d) shrub stage, forest, annual herb stage, perennial herb stage, lichen, moss stage.
216. Which creatures are direct or indirect food of all creatures on the ocean's surface?
 (a) protozoans (b) phytoplanktons (c) fish (d) aquatic insects.
217. Both, hydrarch and xerarch successions lead to :
 (a) Medium water conditions (b) Xeric conditions
 (c) Highly dry conditions (d) Excessive wet conditions
218. The dominant second trophic level, in a lake ecosystem is
 (a) phytoplankton (b) zooplankton (c) benthos (d) plankton
219. A consumer whose carbon atoms have already passed through three species is a -
 (a) scavenger (b) tertiary producer (c) tertiary consumer (d) secondary consumer
220. Which one of the following processes during decomposition is correctly described ?
 (a) Humification-Leads to the accumulation of a dark coloured substance humus which undergoes microbial action at a very fast rate
 (b) Catabolism-Last step in the decomposition under fully anaerobic condition
 (c) Leaching –water soluble inorganic nutrients rise to the top layers of soil
 (d) Fragmentation-Carried out by organisms such as earthworm
221. In an ecosystem, at a particular time, standing crop
 (a) total living material (b) total detritus
 (c) both (a) and (b) (d) total nutrients present in the crop.
222. Which one of the following is not a functional unit of an ecosystem
 (a) Energy flow (b) Decomposition (c) Productivity (d) Stratification
223. In terms of percentage of total forest cover, the most abundant type of the forest in India is
 (a) Tropical evergreen (b) Tropical moist deciduous
 (c) Tropical dry deciduous (d) Tropical scrubs
224. Identify the likely organisms (1), (2), (3) and (4) in the food web shown below:



Options

	(1)	(2)	(3)	(4)
(a)	deer	rabbit	frog	rat
(b)	dog	squirrel	bat	deer
(c)	rat	dog	tortoise	crow
(d)	squirrel	cat	rat	pigeon

225. The given pyramid shows the relative biomass of zooplankton and phytoplankton in a marine ecosystem.



The biomass of the zooplanktons is higher than that of the phytoplanktons because-

- (a) The zooplanktons convert energy more efficiently
 (b) The zooplanktons have a shorter life cycle than the phytoplanktons
 (c) The phytoplanktons are individually much smaller than the zooplanktons
 (d) The phytoplanktons have an extremely high turnover rate
226. Which one of the following statements is correct for secondary succession?
 (a) it is similar to primary succession except that it has a relatively fast pace
 (b) It begins on a bare rock
 (c) It occurs on a deforested site
 (d) It follows primary succession
227. The upright pyramid of number is absent in
 (a) Pond (b) Forest (c) Lake (d) Grassland
228. The rate of formation of new organic matter by rabbit in a grassland, is called :
 (a) Net productivity (b) Secondary productivity
 (c) Net primary productivity (d) Gross primary productivity
229. A term biotype means-
 (a) All individuals having same phenotype (b) All individuals having same genotype
 (c) All individual with different phenotype (d) All individuals with different genotype
230. Identify the possible link "A" in the following food chain :
 Plant → insect → frog → "A" → Eagle
 (a) Rabbit (b) Wolf (c) Cobra (d) Parrot
231. The second stage of hydrosere is occupied by plants like :
 (a) Azolla (b) Typha (c) S x (d) Vallisneria
232. The pyramid of number of a parasitic food chain in forest ecosystem is-
 (a) Always inverted (b) Always upright
 (b) Mixture of inverted & upright (d) Sometimes inverted and sometimes upright
233. The important steps, in the process of decomposition are
 (a) fragmentation and mineralization (b) leaching and catabolism
 (c) humification and mineralization (d) all of these.

234. Secondary productivity is rate of formation of new organic matter by-
 (a) Parasite (b) Consumer (c) Decomposer (d) Producer
235. A sedantary sea anemone gets attached to the shell lining of hermit crab. The association is-
 (a) Symbiosis (b) Commensalism (c) Amensalism (d) Ectoparasitism
236. Natural reservoir of phosphorus is-
 (a) Animal bones (b) Rock (c) Fossils (d) Sea water

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	c	d	c	a	d	d	d	b	d	c	c	c	a	a	b	c	d	c	a	b
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	a	c	c	b	c	b	a	d	c	d	d	c	b	a	d	a	c	c	b	b
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	a	d	d	c	b	b	c	b	c	a	c	a	a	b	b	d	c	d	d	a
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	a	b	a	d	b	a	d	a	a	b	b	b	a	a	c	b	a	a	b	a
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	c	d	d	b	c	d	d	b	d	b	a	b	c	c	a	b	b	d	b	c
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.		d	a	c	d	b	c	b	a	b	a	d	a	c	d	b	c	c	d	c
Ques.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	d	a	c	d	a	a	c	c	a	b	c	c	b	b	a	d	d	d	b	c
Ques.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	c	a	a	c	c	a	d	c	a	a	b	a	a	b	b	a	d	d	a	c
Ques.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	a	b	d	d	d	b	b	b	b	d	a	c	a	c	a	a	b	c	b	c
Ques.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
Ans.	d	c	d	b	a	b	c	a	d	d	c	a	a	a	b	d	c	a	d	a
Ques.	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
Ans.	a	d	b	a	a	a	d	c	a	a	c	d	a	c	a	b	a	b	c	d
Ques.	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236				
Ans.	a	d	b	a	d	c	b	b	a	c	d	a	d	b	a	b				

- 1 Which of the following phyla has largest number of species?
 (a) Arthropoda (b) Echinodermata (c) Cephalochordata (d) Annelida
- 2 The numbers of National Parks, Biosphere and Wildlife sanctuaries of India were:
 (a) 90, 14, 448 (b) 158, 62, 10 (c) 58, 412, 10 (d) 96, 412, 10
- 3 The term "The Evil Quartet" is related with
 (a) four major causes of forest loss (b) four major causes of population explosion
 (c) four major causes of air pollution (d) four major causes of biodiversity losses.
- 4 Which species is most likely to be positively selected by natural selection?
 (a) One with a large gene pool
 (b) One with a medium gene pool
 (c) One with a small gene pool
 (d) No correlation exists between gene pool and natural selection
5. Which species is most likely to be positively selected by natural selection?
 (a) One with a large gene pool
 (b) One with a medium gene pool
 (c) One with a small gene pool
 (d) No correlation exists between gene pool and natural selection
6. Where was the World Summit on Sustainable Development held?
 (a) South Africa (b) U.S.A. (c) South Korea (d) U.K.
7. Which of the following phyla has largest number of species?
 (a) Arthropoda (b) Echinodermata (c) Cephalochordata (d) Annelida
8. Species diversity _____ as we move away from the equator towards the poles.
 (a) Increases (b) Decreases
 (c) First increases then decreases (d) First decreases then increases
9. What is the effect of species diversity, as one moves from high to low altitudes.
 (a) Increases (b) Decreases
 (c) First increases then decreases (d) First decreases then increases
10. Which of the following is not an example of in-situ conservation?
 (a) Biosphere Reserves (b) National Parks
 (c) Wildlife Sanctuaries (d) Zoos and botanical gardens
11. What is Biodiversity referred to as?
 (a) species in a region (b) genes & species in a region
 (c) Genetic, species & ecological diversity in a region (d) Genes and species in an ecosystem
12. What are the total number of hot spots present in the world?
 (a) 25 (b) 29 (c) 34 (d) 39
13. What is the approximate percentage of the earth covered by terrestrial hot spots?
 (a) 1.5% (less than 2%) (b) 2.5% (c) 3.5% (d) 4.5%

14. What is the decreasing order of number of animal species, as far as India is concerned?
 (a) Mammals, Aves, Reptiles, Amphibia (b) Aves, Reptiles, Mammals, Amphibia
 (c) Mammals, Reptiles, Amphibia, Aves (d) Reptiles, Amphibia, Mammals, Aves
15. Which one of the following are two hot spots of biodiversity in India?
 (a) Western ghats & North eastern Himalayas (b) Deccan and Western Ghats
 (c) Himalayan and Deccan Plateau (d) Western Ghats and Gangetic Plains
16. Wild life is destroyed mostly by-
 (a) Lack of proper care (b) Mass scale Hurting
 (c) Destruction of natural Habitats (d) Natural calamity
17. Troublesome American water used weed found in India is-
 (a) Trapa (b) Cyperus (c) Typha (d) Eichormia

A			B			C		
Animals	Species	Members	Animals	Species	Members	Animals	Species	Members
Bird	I	I	Bird	I	2	Bird	I	2
Bird	II	1	Bird	II	2	Mammal	II	2
Bird	III	4	Mammal	III	2	Insect	III	2

Which of the following boxes show maximum, greater and minimum diversity.

- (a) A- Minimum diversity, B - Greater diversity, C - Maximum diversity
 (b) A- Maximum diversity, B - Greater diversity, C - Minimum diversity
 (c) A- Maximum diversity, B - Maximum diversity, C - Greater diversity
 (d) A- Minimum diversity, B - Maximum diversity, C - Greater diversity
19. Which of the following is NOT associated with small populations?
 (a) Homozygosity can increase the fitness of individuals.
 (b) Some degree of inbreeding becomes inevitable.
 (c) Genetic drift can quickly eliminate most alleles, leaving individuals extremely similar genetically.
 (d) Problems arise when allelic diversity is reduced.
20. Breeding place of Flamingo (Hansawar) in India is-
 (a) Sambhar lake (b) Chilka lake (c) Runn of Kutch (d) Ghana vihar
21. Which of the following is incorrectly matched?
 (a) alpha diversity - number of species in a given habitat, (b) genetic diversity - variation of genes within species
 (c) beta-diversity - diversity of habitat in the whole region (d) species diversity-product of species richness & evenness
22. Which of the following is NOT a benefit that humans receive from a biologically diverse world?
 (a) source of medicine (b) source of water (c) source of economic gains (d) source of food
23. As estimated by Robert May, what is the total number of species present on earth?
 (a) 3 million (b) 5 million (c) 7 million (d) 9 million
24. Threats to biodiversity comes from -
 (a) habitat loss (b) Over exploitation (c) Intensive agriculture (d) All
25. Which of the following was the first National Park of India?

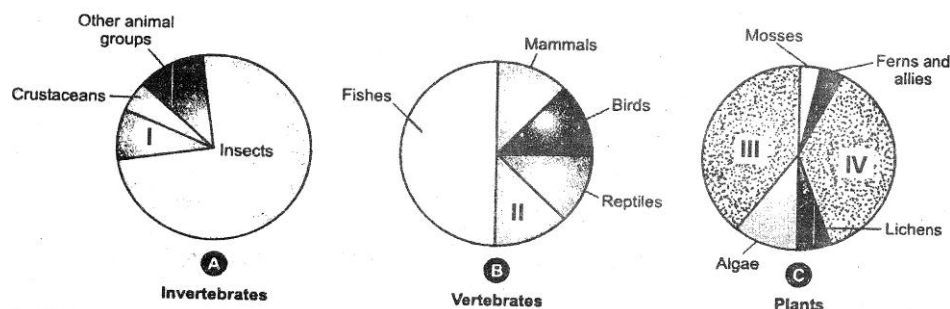
(a) Corbett

(b) Nanda Devi

(c) Kaziranga

(d) Jaldapara

26. The major extinct from India in-
(a) Cannibalism (b) Felling tress (c) Habitat destruction (d) None of these
27. In which part of biosphere reserves human settlement is permissible?
(a) Buffer Zone (b) Transition Zone (c) Core Zone (d) Settlement not allowed
28. Historically, island species have tended to become extinct faster than species living on a mainland. Which of the following reasons can not be used to explain this phenomenon?
(a) Island species have often evolved in the absence of predators and have no natural avoidance strategies.
(b) Humans have introduced diseases and competitors to islands, which negatively impacts island populations.
(c) Island populations are-usually smaller than mainland populations.
(d) Island populations are usually less fit than mainland populations.
29. The narrowly utilitarian arguments for conserving include which of the following from the given list? (i) Industrial products like dyes, lubricants, (ii) Ecosystem services like photosynthesis, (iii) Pollinators layer of bees, birds and bats, (iv) Firewood, fibre and construction material, (v) The aesthetic pleasure of walking through thick, (vi) Products of medicinal importance, (vii) Watching spring flowers in full bloom, (viii) Our moral duty to care for the well-being of each species.
(a) (i), (ii), (v) and (vii) (b) (ii), (iii), (v) and (vii) (c) (i), (iv) and (vi) (d) (iii), (v), (vii) and (viii)
30. In island biogeography, $c =$
(a) number of species
(b) a constant measuring the slope of the line
(c) a constant measuring number of species per unit area of habitat
(d) area
31. Idri Idri is found is-
(a) Australia (b) Madagascar (c) Mauritius (d) Tasmania
32. Why are conservationists calling for immediate, and often expensive, action on behalf of endangered species an habitats?
(a) Biodiversity is beneficial to humans. (b) Man has brought on climate change.
(c) Extinction is an unnatural process. (d) It would be more costly, financially, if we did not act.
33. Given below are pie diagrams A, B and C related to proportionate number of species of major taxa of invertebrates, vertebrates and plants respectively. Critically study and fill in the blanks I, II, III and IV.



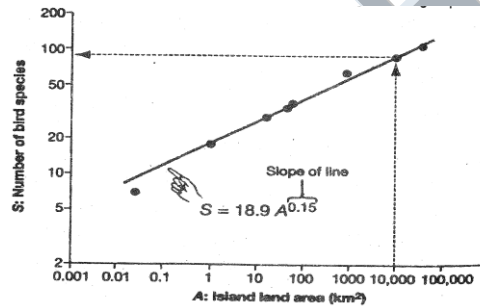
- (a) i-Molluscs, II-Amphibians, III-Fungi, IV-Angiosperms
(b) I-Molluscs, II-Amphibians, III - Angiosperms, IV-Fungi

- (c) I - Hexapoda, II-Amphibians, III-Fungi, IV-Angiosperms
 (d) I -Turtles, II -Amphibians, III -Fungi, IV-Angiosperms

34. Which is not a valid reason for the species-area relationship?

- (a) larger areas have higher z values (b) extinction rates are greater on small islands
 (c) larger "core" areas (d) larger areas contain more habitats

35. Using the figure, determine the percentage of bird species that will be lost if the island's inhabitable land area is reduced from 100,000 km² to 1 km².

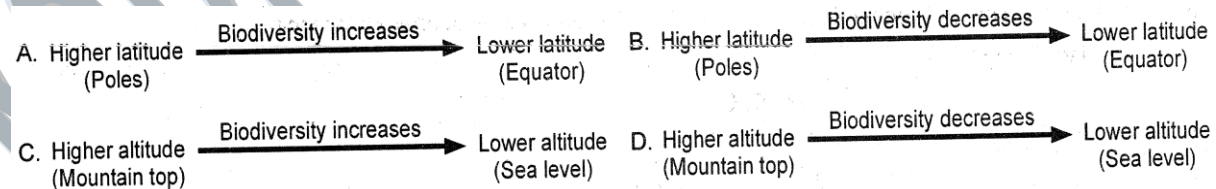


- (a) 17 percent of the bird species will be lost.
 (b) 20 percent of the bird species will be lost.
 (c) All of the bird species will be lost.
 (d) 83 percent of the bird species will be lost.

36. Commercial latex is obtained from-

- (a) Euphorbiaceae (b) Acacia arabica (c) Tectona grandis (d) Maritima eucalyptus

37.



Which of the above is correct?

- (a) A and B (b) B and C (c) A and C (d) C and D

38. What is sustainable use?

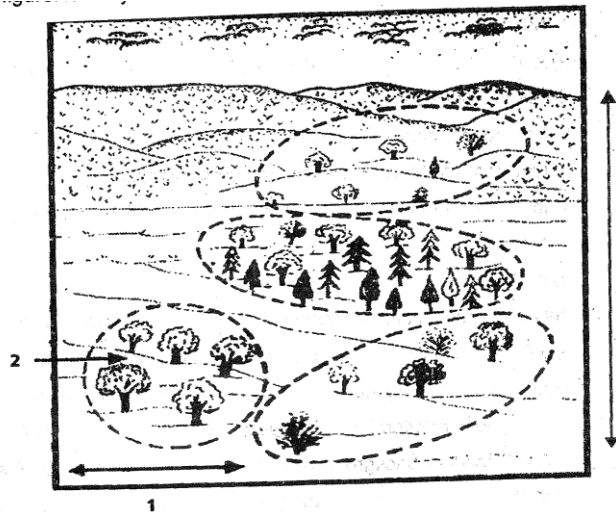
- (a) The study of methods to help protect biodiversity.
 (b) Protected strips of land that allow organisms to migrate from one wilderness, area to another.
 (c) A law that makes it illegal to do harm to species that are listed as endangered or threatened.
 (d) The ability to use natural resources in a way that helps people and protects the ecosystem.

39. According to conservation biologists, how much of the Earth's land surface should be strictly protected?

- (a) 25% (b) 5% (c) 50% (d) 10%

40. When the last member of a particular species dies, the species is said to be _____.
 (a) isolated (b) endangered (c) diversified (d) extinct

41. Different types of diversity are shown in the figure. Identify them.



- (a) 1 - Alpha-diversity, 2 - Beta-diversity, 3 - Gamma diversity
 (b) 1 - Gamma-diversity, 2 - Alpha-diversity, 3 - Beta diversity
 (c) 1 - Gamma-diversity, 2 - Beta-diversity, 3 - Alpha diversity
 (d) 1 - Beta-diversity, 2 - Alpha-diversity, 3 - Gamma diversity
42. Most large whale species have been driven to the brink of extinction. Which of the following is the most accepted explanation for this situation?
 (a) Overexploitation (b) habitat loss
 (c) pollution (d) competition from introduced species
43. Biosphere reserves differ from national parks and wild life sanctuaries because in the former-
 (a) Human beings are not allowed to enter
 (b) People are an integral part of the system
 (c) Plants are paid greater attention than the animals
 (d) Living organisms are grouped from all over the world and preserved for posterity
44. Conservation hotspots are best described as
 (a) areas with large numbers of endemic species that are disappearing rapidly.
 (b) areas where people are particularly active supporters of biological diversity.
 (c) islands that are experiencing high rates of extinction.
 (d) areas where native species are being replaced with introduced species.
45. The ____ encourages the division of protected areas into zones with different purposes and levels of human impact.
 (a) Man and Biosphere Program (MAB)
 (b) Biosphere Reserve
 (c) Chipko Andolan Movement

- (d) IUCN world conservation strategy
46. Identify the odd combination of the habitat and the particular animal concerned.
- (a) Sunderbans_____ Bergal tiger (b) Periyar_____ Elephant
(c) Rann of kutch_____ wwil Ass (d) Dachigam national park_____ Snao leopard
47. Which of these statements is true?
- (a) Biodiversity tends to increase as you get closer to the equator
(b) Tropical regions of Earth contain very few of the world's land species.
(c) Coral reefs tend to be less biologically diverse than temperate deciduous forests.
(d) Cold climates have greater amounts of biodiversity than warm climates.
48. Which of the following countries has the most deforestation today?
- (a) Brazil (bj) 'United States (c) Japan (d) none of the above
49. A keystone species is one that
- (a) has a higher likelihood of extinction than a nonkeystone species.
(b) exerts a strong influence on an ecosystem.
(c) causes other species to become extinct.
(d) has a weak influence on an ecosystem.
50. What is the difference between; a threatened species and an endangered species ?
- (a) A threatened species is already extinct. An endangered species means that the population's numbers have increased greatly over the last 5 years.
(b) A threatened species and an endangered species are the same thing.
(c) A threatened species means that the population is likely to become endangered. An endangered species is already extinct.
(d) A threatened species means that the population is likely to become endangered. An endangered species has population numbers so low that it is likely to become extinct.
51. How much of the Earth's land surface have humans disturbed or degraded?
- (a) 60-70% (b) 5-10% (c) 30-40% (d) 10-20%
52. An endemic species is
- (a) one found in many different geographic areas.
(b) one found naturally in just one geographic area,
(c) one found only on islands.
(d) one that has been introduced to a new geographic area.
53. The lion-tailed mankeys macaca silenus are found only in-
- (a) Kaziranga (b) Eastern ghats and Chennai
(c) Western ghats including travancore and Mysore (d) Himalayas
54. Ex situ strategies include -
- A. Botanical garden B. Zoos

- C. Seed / Pollen banks D. Gene bank and tissue culture
 (a) A, B (b) A, B, C (c) B, C, D (d) A, B, C, D

55. Which one of the following is a pair of Endangered species ?
 (a) Garden lizard and Mexican poppy (b) Rhesus monkey and sal tree
 (c) Indian peacock and cannot glass (d) florinbill and Indian aconite
56. An exotic species that is introduced to a new area, spreads rapidly and eliminates native species is called -
 (a) an immigrant species (b) an invasive species (c) destructive species (d) none
57. A. More than 70 percent of all the species recorded are animals.
 B. Out of every 10 animals on this planet, 7 are insects.
 C. The number of fungi species in the world is more than the combined total of the species of fishes, amphibians, reptiles and mammals.
 D. Number of fishes is very less than that of mammals.
 (a) All correct (b) All incorrect (c) A, B and C are correct (d) Only D is correct
58. The impacts of loss of biodiversity include -
 A. Decrease in plant production.
 B. Lowered resistance to environmental perturbation
 C. Increased variability in ecosystem processes like water use, pest / disease cycle, plants productivity.
 D. None
 (a) A, B (b) A, B, C (c) B, C (d) D
59. According to the concept of species area relations -
 (a) The number of species in an area increases with the size of the area.
 (b) Larger species require larger habitat areas than do smaller species.
 (c) Most species within any given area are endemic.
 (d) The larger the area, the greater the extinction rate.
60. Which of the following statements describe natural extinction?
 A. Extinctions abetted by human activities. B. Slow replacement of existing species
 C. Also known as background extinction D. A small population is most likely to be extinct.
 (a) A, B (b) A, B, C (c) B, C, D (d) A, B, C, D
61. Which is / are correct about Amazon rain forest? A. It is called Lungs of the planet.
 B. It is being cut and cleared for cultivating soya beans or for conversion to grasslands for raising beef cattle.
 C. The largely tropical rain forest in South America has highest biodiversity on earth
 D. It harbours probably millions of species,
 (a) A, B (b) A, B, C (c) B, C, D (d) A, B, C, D
62. Forest research institute is situated at-
 (a) Naisital (b) Chennai (c) Kolkata (d) Dehradun
63. The characters of a stable community -
 A. It shall not show too much variations in year to-year productivity.
 B. It must be either resistance or resilient to seasonal disturbance.
 C. It must be resistant to invasion by new species.
 D. None

64. Select the correct statement(s).
 A. India has more than 50,000 genetically different strains of rice
 B. India has 1000 varieties of mango
 C. The genetic variation in *Rauwolfia vomitoria* can be in terms of cone and potency of reserpine.
 D. The tropical rain forest initially covered 14% of the land surface of earth, but now they cover only 6% of the land area.
 (a) A, B (b) A, B, C (c) B, C, D (d) A, B, C, D
65. In situ strategies include-
 A. Biosphere reserve B. National park C. Wildlife sanctuaries D. sacred forests / lakes
 (a) A, B (b) A, B, C (c) B, C, D (d) A, B, C, D
66. A species-area relation is used by ecologists to -
 (a) Determine the population density of a species in a certain habitat.
 (b) Examine how human populations are growing
 (c) Estimate the number of species extinctions resulting from habitat destruction
 (d) None
67. The number of critically endangered animals and plants in India is -
 (a) 4 & 8 respectively (b) 18 & 44 respectively (c) 180 & 4 respectively (d) 44 & 18 respectively
68. Biodiversity loss occurs due to -
 A. Habitat loss and fragmentation B. Co-extinction
 C. over-exploitation D. en species invasion.
 (a) A, B (b) A, B, C (c) B, C, D (d) A, B, C, D
69. **Column I** **Column II**
 I. Silent valley (A) Kaziranga
 II. Rhinoceros (B) Bandipur
 III. Tiger project in Karnataka (C) in situ
 IV. National Park (D) Tropical evergreen forest
 (a) I-B, II-A, III-D, IV-C (b) S-D, II-A, III-B, IV-C
 (c) I-A, II-C, III-B, IV-D (d) I-B, II-A, III-C, IV-D
70. Select incorrect statement
 (a) Photochemical smog has mainly O₃, PAN and NO_x
 (b) CFC is most effective green house gas
 (c) Biodiversity decreases from lower to higher altitudes and increases from lower to higher latitudes
 (d) Dodo and Tasmanian wolf have become extinct due to overexploitation
71. The devastation due to floods in Uttarakhand in June 2013 was due to-
 (a) Increased deforestation
 (b) Collection of moisture and increased cloud formation over the Invers Mandakini
 (c) Construction of houses and hotels on the river bed
 (d) All of the above
72. **Column I** **Column II**
 I. Nile Perch in Lake Victoria (A) Obvious reasons for biodiversity conservation
 II. Narrowly utilitarian (B) Habitat destruction

III. Main cause for biodiversity loss

IV. Hot spots

(a) j-B, si- A, HI-D, tv-c

(c) I-A, II-C, III-B, IV-D

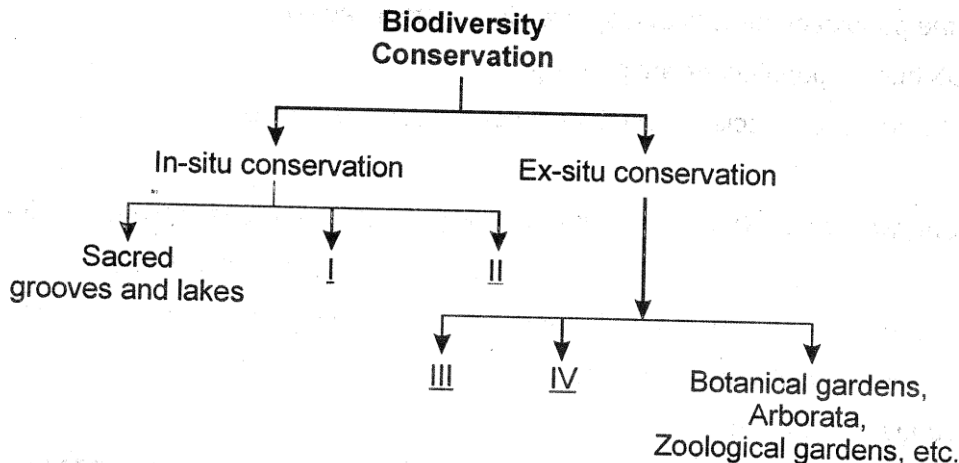
(C) High endemism

(D) end species

(b) I-D, II - A, III-B, IV-C

(d) I-B, II-A, III-C, IV-D

73. Given below is incomplete flow chart depicting in-situ and ex-situ approaches of conserving biodiversity. Study carefully and fill in the blanks I, II, III and IV.



- (a) I - Biosphere reserves; II - National parks and wildlife sanctuaries; III - Sacred plants, Home gardens; IV - Seed banks, field gene banks, cryopreservation, etc.
- (b) I - Sacred plants, Home gardens; II - National parks and wildlife sanctuaries; III - Biosphere reserves; IV - Seed banks, field gene banks, cryopreservation, etc.
- (c) I - Biosphere reserves; II - Seed banks, field gene banks, cryopreservation, etc.; III - Sacred plants, Home gardens; IV - National parks and wildlife sanctuaries.
- (d) I - Biosphere reserves; II - Sacred plants, Home gardens; III - National parks and wildlife sanctuaries; IV - Seed banks, field gene banks, cryopreservation, etc.

74. Which are in a matching sanctuary-

(a) Kaziranga-mink deer (b) Gir-Lion (c) Himalayas-Samber (d) Sunderbon-phiro

75. Which of the following fishes is exotic species introduced in India for aquaculture -

(a) Dog fish (b) Shark (c) Catfish (*Clarias*) (d) Labeo

76. Dudhwa national park is located in-

(a) Himachal Pradesh (b) Uttar Pradesh (c) Madhya Pradesh (d) Arunachal Pradesh

77. **Column I**

I. Term biodiversity

II. in situ conservation

III. Plant pollination

IV. Ex-situ conservation

(a) I-B, II - A, III-D, IV-C

Column II

(A) Edward Wilson

(B) Co-extinction

(C) On-site conservation

(D) Offsite conservation

(b) I-D, II-A, III-B, IV-C

- (c) I-A, II-C, III-B, SV-D (d) i-B, II-A, m-C, IV-D
78. More than 25% of drugs are derived from plants. What benefits does this describe?
 (a) Ethical value (b) Aesthetic value (c) Direct economic value (d) Indirect economic value
79. Modern *Ex situ* conservation includes -
 (a) cryopreservation techniques (b) in vitro fertilisation
 (c) plants can be propagated using tissue culture methods (d) All
80. *Ex situ* conservation is used for the conservation of -
 (a) All plants (b) All animals
 (c) threatened animals and plants (d) None
81. Bandipur (Karnataka) National park runs a project for -
 (a) Peacock (b) Deer (c) Tiger (d) Elephant
82. **Column I** **Column II**
 I. Western Ghats (A) Sacred lake
 II. Donkey (B) Secondary home India
 III. Khecheopairi Lake of Sikkim (C) Hot spot
 IV. Rhinoceros (D) Kaziranga
 (a) I-B, II-A, III-D, IV-C
 (b) I-D, II-A, III-B, IV-C
 (c) I-A, II-C, III-B, IV-D (d) I-C, II-B, III-A, IV-D
83. Nandan Kanan zoo is known for the -
 (a) Nilgiri Cows (b) Hippopotamuses
 (c) White tiger (d) Rhinoceros
84. **Column I** **Column II**
 I. Dodo (A) Rauwolfia
 II. Reserpine (B) Mauritius
 III. Botanical gardens (C) Khasi and Jaintia hills.
 IV. Sacred forests (D) Ex-situ conservation
 (a) I-B, II-A, III-D, IV-C
 (b) I-D, II-A, III-B, IV-C
 (c) I-A, II-C, III-B, IV-D (d) I-B, II-A, III-C, IV-D
85. Exploring molecular, genetic and species-level diversity for products of economic importance like medicines is called -
 (a) Bioremediation (b) Bioprospecting (c) Bioprocessing (d) Ecosystem services.
86. Which one of the following is false about Habitat loss and fragmentation?
 (a) This is the most important cause driving animals and plants to extinction
 (b) The most dramatic examples of habitat loss come from temperate rain forests
 (c) Once covering more than 14% of the earth's
 (d) The Amazon rain forest harbouring probably millions of species is being cut and cleared for cultivating soya bean or for conversion to grassland for raising beef cattle
87. Which of the following statements is true concerning the relationship between humans and the rest of the living world?
 (a) Modern technology has made it so that we no longer depend on other living organisms.

- (b) We are dependent on artificial ecosystems, such as agroecosystems, but gain no benefit from natural ecosystems.
- (c) We are dependent on natural ecosystems at present, but the technology exists to completely replace natural ecosystems so that we will no longer depend on them.
- (d) Our survival is tightly linked to the survival of natural ecosystems throughout the world.
88. Which of the following statements about species-area relationships and their consequences for extinction rates is false?
- Species-area relationships can be used to predict future extinction rates.
 - The number of species present increases with the size of an area.
 - 50% of Earth's species may become extinct in the next 50 years.
 - Extinction rates are generally higher on mainlands than on islands.
89. Why do species extinctions matter?
- They don't matter unless the species is a human food source.
 - Many pharmaceutical products are derived from natural products, loss of species could mean loss of therapeutic drugs.
 - Soil erosion may increase if certain plants go extinct.
 - b and c
90. Kashmir stag is commonly found in-
- Dachigam wild life sanctuary
 - Manas wild life sanctuary
 - Bhanatpur wild life Sanctuary
 - Annamalai wild life sanctuary
91. Which of the following is not a reason to protect biodiversity?
- The aesthetic value
 - Because of mutualistic relationships, whole communities could be endangered by the extinction of one species.
 - Important medicinal compounds can be found only in certain species.
 - None of the above
92. In recent years the number of species driven to extinction has increased dramatically. Which of the following is not a reason for this?
- Overexploitation
 - Habitat destruction
 - Introduction of predators
 - Natural predation
93. Which of the following is true?
- The biological wealth of our planet has been declining rapidly and the accusing finger is clearly pointing to human activities
 - The colonisation of tropical Pacific Island by humans is said to have led to the extinction of more than 2,000 species of native birds
 - The IUCN Red list (2004) documents the extinction of 784 species in last 500 years
- A, B and C is correct
 - A and B is correct
 - B and C is correct
 - A and C is correct
94. When a species goes extinct in one area, it is often desirable to reintroduce the species from other populations. A major problem with this approach is that
- genetic diseases can easily be introduced when the species is reintroduced.
 - populations are often adapted to local conditions and may not survive when moved to a different location.
 - the community will have adapted to the extinct species' absence. Reproduction may seriously disrupt the community.
 - it is difficult to get an adequate sample of individuals to properly reestablish the population.

95. Tadoba national park is situated in-
 (a) Madhya Pradesh (b) West Bengal (c) Kerala (d) Maharashtra
96. Which parameter of a population do ecologists measure to assess extinction risk for a population?
 (a) genetic variation (b) behavior (c) physiology (d) a, b, and c
 (a) They don't matter unless the species is a human food source.
 (b) Many pharmaceutical products are derived from natural products, loss of species could mean loss of therapeutic drugs.
 (c) Soil erosion may increase if certain plants go extinct, (d) b and c
97. Which of the following is not currently a major cause of species extinctions?
 (a) Habitat destruction (b) Climate change (c) Overexploitation (d) Introduction of predators
98. Of the following organisms which has the highest conservation priority?
 (a) A plant found on North America and in Europe. (b) A plant endemic to Australia
 (c) A plant found on the Galapagos islands and in Brazil, (d) A plant found world wide.
99. The number of species that become extinct due to habitat destruction is greatest in _____ ecosystems with many _____ species.
 (a) temperate, migratory (b) tropical, endemic (c) temperate, keystone (d) tropical, migratory
 Major causes of human-induced extinctions of species include all of the following, except
 (a) climate modification. (b) Overexploitation. (c) habitat destruction. (d) captive propagation.
100. Which of the following methods could be used to restore a population of animals from a few male and female individuals.
 (a) Cross breeding (b) Interbreeding (c) Captive breeding (d) Selective breeding
101. Red data book deals with-
 (a) Endemic plants (b) Plants sharing photoperiodism
 (c) Plants on the verge of extinction (d) None
102. Amazon rain forests are considered as lungs of the planet as they contribute _____ of the total oxygen in the earth's atmosphere.
 (a) 10% (b) 15% (c) 20% (d) 30%
103. How many percent of the earth's land area is covered by all the biodiversity hotspots.
 (a) More than two percent (b) Less than two percent (c) More than five percent (d) Less than ten percent
104. Given below are three statements (A-C) each with one or two blanks. Select the option which correctly fills up the blanks.

Statements:

Ecologists and evolutionary biologists have proposed various hypotheses; some important ones are

A. Speciation is generally a function of time I _____ regions were subjected to frequent glaciations in the past, II _____ have remained relatively undisturbed for millions of years and thus, had a long evolutionary time for species diversification.

B. _____ III _____ environments, unlike temperate ones, are less seasonal, relatively more constant and predictable. Such constant environments promote niche speciation and lead to a greater species diversity.

C. There is more solar energy available in the IV which contributes to higher productivity; this in turn might contribute indirectly to greater diversity.

Options:

- (a) I - temperate, II - tropical latitudes, IN - tropical, N - tropics
- (b) I-tropical, II-tropical latitudes, III-temperate, IV-Savannah
- (c) I - tropics, II - tropical latitudes, III - temperate, IV -Arctic Tundra
- (d) I - temperate, II - tropical latitudes, III - tropics, IV - Chapparral

105. How much times have forests been lost in the tropics compared to the temperate region

- (a) 50 times
- (b) 40 times
- (c) 30 times
- (d) 25 times.

106. Which of the following of false?

- (a) Species diversity — The Western Ghats have lesser amphibian species diversity than the Eastern Ghats
- (b) Ecological diversity—At the ecosystem level, India, for instance, with its deserts, rain forests, Mangrooves, Coral reef
- (c) It has taken million of year of evolution, to accumulate this rich diversity in nature
- (d) Biodiversity and its conservation are now vital environmental issues of international concern as more and more people around the world begin to re se the critical importance of diversity.

107. Introduction of en species into new area possess a threat to extinction of indigenous species due to

- (a) Their high nutrient requirement
- (b) Their symbiotic relationship
- (c) Absence of its natural predator
- (d) More intraspecific competition

108. Which of the following is correct?

- (A) Three of the hotspot — Western Ghats and Sri Lanka, Indoburma and Himalaya cover our country's exceptionally high biodiversity region
- (B) India now has 14 biosphere reserves, 90 national parks and 448 wildlife sanctuaries
- (C) Ex *situ* conservation — In this approach, threatened animals and plants are taken out from their natural habitat and placed in special setting

- (a) A, B and C is correct
- (b) A, B is correct
- (c) B and C is correct
- (d) A, C is correct

109. There are genetic variation shown by medicinal plant Rauwolfia vomitoria. This plant growing in which one of the following regions

- (a) Deccan Peninsula
- (b) Gangatic plains
- (c) Himalayan, ranges
- (d) North-East.

110. In the formula $\log S = \log C + Z \log A$, Ecologist have discovered that the value of z lies in the range of

- (a) 0.1 to 0.5
- (b) 0.5 to 1
- (c) 0.1 to 0.2
- (d) 1 to 5

111. If the Bengal tiger becomes extinct-

- (a) Hyaenas and Wolves will become scarce
- (b) The wild Oveas will be safe for man and domestic animals
- (c) Its gene pool will be lost forever
- (d) The population of beautiful animals like deers will be stabilized.

112. Which of the following does not belong to The Evil

- (a) Habitat loss and fragmentation
- (b) Over exploitation

113. What is the primary reason for targeting 'biodiversity hotspots¹ for conservation?
- They are the only areas where species are seriously threatened in the world
 - The number of species threatened far exceeds our capacity to protect them and we can therefore only concentrate on areas of highest species diversity
 - They are areas where people do not live and conservation would therefore not be affecting the economic development of the area
 - To protect all areas of threatened species would not allow for new species to develop
114. 1500 enderive species of dicohyledons are found is-
- Eastern Hinalayas
 - Eastern Ghats
 - Western Hinalayas
 - Western Ghats
115. Approximately what proportion of the global land surface is used for agriculture and grazing by the world's 6 billion people?
- One eightieth
 - One tenth
 - Three quarters
 - One third
116. Which of the following represent maximum number of species among global biodiversity ?
- Lichens
 - Fungi
 - Mosses and Ferns
 - Algae
117. Total number of identified biodiversity hot spots in the world is
- 25
 - 24
 - 40
 - 34
118. Sacred groves are specially useful in :
- generating environmental awareness
 - preventing soil erosion
 - year-round flow of water in rivers
 - conserving rare and threatened species
119. Which of the following statement is true?
- Logo of WWF-N is Red Panda.
 - Organization responsible for maintaining Red Data Book / Red List is IUCN.
 - Genetic diversity in agricultural crops is threatened by extensive intercropping.
 - In India, we find mangoes with different flavours, colours, fibre-content, sugar content and even shelf-life. The large variation is on account of genetic diversity
 - The world biodiversity day is celebrated annually on 29th December,
- A and B
 - CandD
 - None
 - All
120. Which hypothesis suggests ecosystems are like aeroplane wings where flight (ecosystem functioning) may or may not be compromised depending upon which species are lost-
- rivet popper hypothesis
 - Gaia hypothesis
 - Cause - exclusion hypothesis
 - Oudum's hypothesis
121. Select the correct statement about biodiversity:
- The desert areas of Rajasthan and Gujarat have a very high level of desert animal species as well as numerous rare animals.
 - Large scale planting of Bt cotton has no adverse effect on biodiversity.
 - Western Ghats have a very high degree of species richness and endemism.
 - Conservation of biodiversity is just a fad pursued by the developed countries
122. In a national bark, protection is provided to-
- Flora only
 - Faura only
 - Both flouna and fauna
 - Entire ecosystem
123. Biosphere reserve- "Delab debang" is located is-

- (a) West Bengal (b) Aunachal Pradesh (c) Kerala (d) gulf of Mannar
124. Kanha National Park is located in _____ and is famous for _____.
 (a) Madhya Pradesh, elephant (b) Madhya Pradesh, tiger
 (c) Odisha, tiger (d) Assam, elephant.
125. Given below are three statements (A-E) each with one or two blanks. Select the option which correctly fills up the blanks. **Statements:**
 A. The tropics (between I) harbour more species than temperate and polar regions.
 B. For example, Columbia situated near II has about 1400 species of birds, while New York (41 °N) has 105 species, Greenland (71 °N) has about 56 species and India (in the equator region) has III species. C. The number of species of vascular plants in tropics is about IV times more of that of temperate forests.
 D- The V rain forest in Brazil, South America has the greatest biodiversity on earth. E. Since the origin of life on earth and evolution, there have been five episodes of mass extinction, but the current rate of extinction (6 mass extinction - due to human activities) is VI times faster than them, due to human activities.
- Options:**
 (a) I - 0°N to 90°S, II-equator, 111-1200, IV - five , V-Amazonian, VI -100-1000
 (b) I - 23.5°N to 23.5°S, II - equator, III -10000, IV - ten, V -Amazonian, VI -100 -1000
 (c)I-23.5°Nto23.5°S, II-equator, 111-1200, IV-ten, V- Amazonian, VI -100- 1000
 (d) I - 23.5°N to 23.5°S, II - equator, III -1200, IV - ten, V -Amazonian, VI -100 - 10000
126. Which one of the following have the highest number of species in nature?
 (a)Angiosperms (b) Fungi (c) Insects (d) Birds
127. Maximum nutritional diversity is found in the group.
 (a) Fungi (b)Anim a (c)Monera (d)Plantae
128. India has only 2.4% of the world's land area but its share of the global species diversity is
 (a) 1.8%. (b)3.1% (c)5.1% (d)8.1%
129. Which one of the following shows maximum genetic diversity in India?
 (a) Mango (b) Groundnut (c)Rice (d) Maize
130. Which one of the following areas in India, is a hotspot of biodiversity
 (a) Eastern Ghats (b) Gangetic Plain (c) Sunderbans (d) Western Ghats
131. The world summit on sustainable development held in 2002 in Johannesburg, South Africa, how many countries pledged their commitment to achieve by 2010.
 (a)180 (b)190 (c)200 (d)210

ANSWER KEY

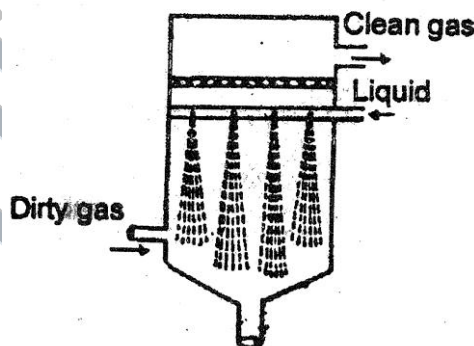
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Ans.	a	a	d	a	a	a	d	b	a	d	c	b	a	b	a	c	d	a	a	b
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	c	b	c	d	a	c	b	d	c	c	b	a	a	a	d	a	c	d	d	d
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	d	a	b	a	a	d	a	a	b	d	a	b	c	d	d	b	c	b	a	c
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Ans.	d	d	b	d	d	c	b	d	b	c	d	b	a	b	c	b	c	c	d	c
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	d	d	c	a	b	b	d	d	d	a	d	d	a	b	d	d	b	b	b	c
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	c	c	b	a	b	a	c	a	c	c	c	c	b	d	d	b	d	d	d	a
Ques.	121	122	123	124	125	126	127	128	129	130	131									
Ans.	c	d	b	b	c	c	c	d	c	d	c									

1. By what degrees has the mean global temperature increased in the 20th century?
 (a) 0.2% (b) 0.4% (c) 0.6% (d) 0.8%
2. Which of the following is a natural pollutant?
 (a) Smog (b) Volcanic gases (c) Strong wind (d) Gale
3. In Effluent Treatment Plants (ETPs), at which stage microorganism treatment is provided?
 (a) Primary (b) Secondary
 (c) Tertiary (d) Microorganisms are not used in ETPs
4. Of the following, pick out the constituents of a photochemical smog
 A. Ozone B. Nitrogen oxides C. PAN D. H_2SO_4 E. DDT
 F. BHC G. CO_2
 (a) A, B, C (b) A, B, C, G (c) B, C, D, G (d) A, B, C, E, F, G
5. Algal bloom is caused by
 (a) Availability of excess nutrients (b) Lack of nutrients
 (c) Increase in non-biodegradable pollutants (d) Decreased BOD
6. When domestic sewage mixes with river water -
 (a) small animals like rats will die after drinking river water
 (b) the increased microbial activity releases micronutrients such as iron
 (c) the increased microbial activity uses up dissolved oxygen
 (d) the river water is still suitable for drinking as impurities are only about 0.1 %
7. Green muffler is used against which type of pollution?
 (a) air (b) soil (c) water (d) Meter
8. Match column I with column II and select the correct option.

Column I	Column II
(A) Catalytic converter	(i) Particulate matter
(B) Electrostatic precipitator	(ii) Carbon monoxide and nitrogen oxides
(C) Earmuffs	(iii) High noise level
(D) Land fills	(iv) Solid wastes

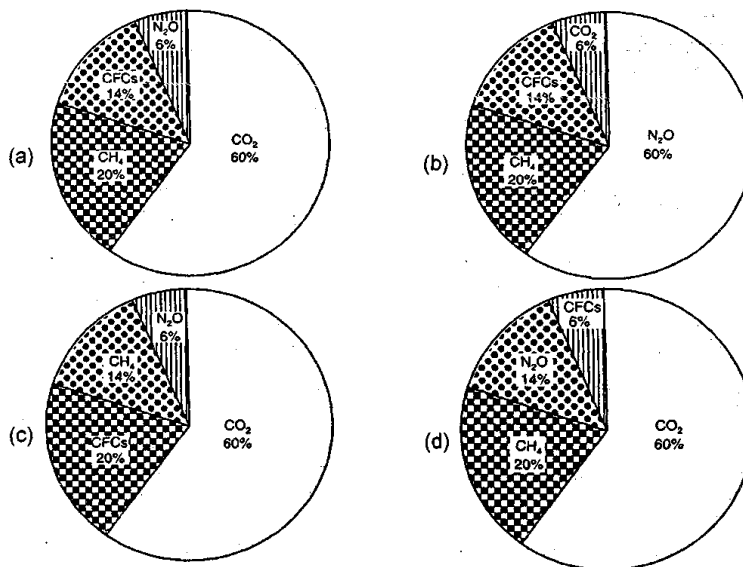
	A	B	C	D
(a)	(0	(ii)	(iii)	(iv)
(b)	<"	(0	(iii)	(iv)
(c)	(iv)	(iii)	(ii)	(0"
(d)	(iii)	(ii)	(iv)	(i)
9. What are organisms that can tolerate high degrees of pollution called as?
 (a) Indicator species (b) Extreme species (c) Stenohy ne species (d) Osmoconfirmers
10. Which of the following is/are correct regarding Montreal Protocol?
 (i) Persistent organic pollutants,
 (ii) Global warming and climate change.
 (iii) To control the emission of ozone depleting substances.
 (iv) Biosafety of genetically modified organisms.

- (a) (ii) & (iii) (b) (iii) only (c) (iii) & (iv) (d) (i) & (iii)
11. In treatment of waste water, biological treatment is -
 (a) Secondary treatment (b) Primary treatment
 (c) Tertiary treatment (d) Reverse osmosis stage
12. Which is a non-degradable pollutant?
 (a) Smoke (b) Polythene (c) Copper scraps (d) Iron scraps
13. Minamata disease is caused by contamination of
 (a) Hg (b) Pb (c) Cd (d) As
14. The phenomenon by which certain pollutants (e.g. DDT) accumulate in body tissue in increasing concentration is called
 (a) Biological magnification (b) Biological reduction
 (c) Bio-precipitation (d) Bio-degradation
15. Two lakes, A & B are identical in all aspects except that lake A has higher temperature. Which of the following is true?
 (a) A has higher rate of Oxygen dissolution (b) B has higher rate of Oxygen dissolution
 (c) Oxygen dissolution of both is the same (d) Both have same BOD
16. According to size of air pollutants, range and types of chemical the above shown device is best used to control which of the following pollutants?

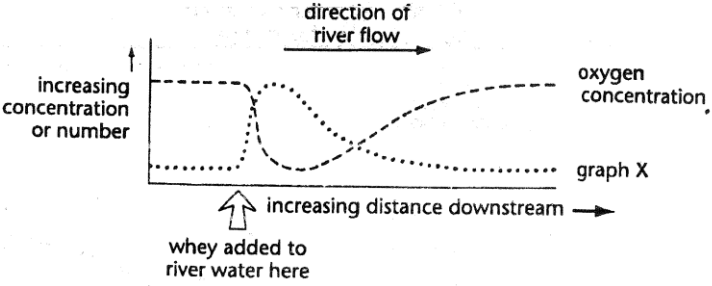


- (a) large particulates (b) charged particulate matter (c) dissolved gases (d) fine particles
17. Which of the following is correct about "El Nino effect"?
 (a) temperature rise leads to odd climatic changes (b) cutting down the use of fossil fuels,
 (c) planting trees (d) slowing down the growth of human population.
18. The process of nutrient enrichment of water is called as _____.
 (a) Eutrophication (b) Stratification (c) Atrophication (d) Biomagnification
19. ____ are used in electrostatic precipitators.
 (a) Catalysts (b) Absorbers (c) Electrodes (d) Chemicals
20. In India, the Air (Prevention and Control of Pollution) Act came into force in 1981 but was amended in 1987 to include
 (a) thermal pollution (b) radioactive pollution (c) noise pollution (d) ozone pollution.
21. The effect of today's radioactive fall out will be harmful to children of future generation than to children because
 (a) infants are more susceptible to radiations (b) susceptibility to radiation increase with age
 (c) mutated genes are frequently recessive (d) contamination of milk supply is not cumulative

22. In India, Jhum cultivation is practiced mainly in
 (a) North East states (b) Gangetic plains (c) Dobson (d) Deccan plateau
23. Pick out the correct choice from the following
 (a) As BOD increases, DO increases
 (b) As BOD increases, DO decreases
 (c) It depends on the water body and the surrounding environment
 (d) No such relation exists between BOD & DO
24. Thickness of ozone is measured in
 (a) Decibel (b) Dozen (c) water (d) noise
25. In a aquatic food chain polluted by DDT, the tissue concentration of DOT would be highest in
 (a) Aquatic weed (b) Herbivorous fish (c) Carnivores fish (d) Bird feeding on fish
26. Increasing skin cancer and high mutation rate are the result of
 (a) Ozone depletion (b) Acid rain (c) CO pollution (d) CO₂ pollution
27. When and where the Ozone hole was discovered?
 (a) 1985, Antarctica (b) 1985, Arctic (c) 1987, Arctic (d) 1987, Antarctica
28. The Earth Summit, 1992, was held at
 (a) Rio de Janeiro (b) Kyoto (c) St. Petersburg (d) Washington
29. Which of the following pair(s) is / are correctly matched?
 A. fossil fuel burning - CO₂ release
 B. nuclear plant- Radioactive wastes
 C. CO₂ - Green house effect
 D. Montreal protocol - Control O₃ depletion,
 (a) A, B (b) A,B,C (c) A, D (d) A, B, C, D
30. DOT causes-
 (a) Air pollution (b) Water pollution (c) Soil pollution (d) All
31. Which of the following will be found in polluted water?
 A. B. G. A B. Larvae of stonefly C. water hyacinth D. sewage fungi
 (a) A,B (b) A,B,C (c) A, C, D (d) A, B, C, D
32. Which of the following figures shows correct relative contribution of greenhouse gases to global warming?



33. Biological oxygen demand of _____ is the least,
 (a) sewage (b) sea water (c) pure water (d) polluted water
34. Pollution in big cities can be controlled to a large extent by –
 A. Improving traffic condition and road. B. Road side plantation
 C. Proper disposal of garbage and domestic as well as municipal wastes.
 D. Cannot be controlled
 (a) A, B (b) A, B, C (c) A, D- (d) A, B, C, D
35. Which method is used for the removal of sulphur dioxide and ammonia from the polluted air?
 (a) Wet scrubbers (b) Absorption (c) Gravitational method (d) Electrostatic precipitator
36. DDT-
 A. is a non-degradable pollutant
 B. shows biomagnification
 C. is harmful to fishes and birds
 D. is a pesticide
 (a) Only D is correct (b) Only B and C are correct (c) None is correct (d) All are correct
37. Limit of BOD prescribed by Central Pollution control Board for the discharge of industrial and municipal waste water into natural surface water, is -
 (a) < 30 ppm (b) < 3.0 ppm (c) < 10 ppm (d) 100 ppm
38. BOD is _____ in polluted water and _____ in potable water.
 (a) more, less (b) less, medium (c) medium, more (d) less, more
39. Due to eutrophication _____.
 (a) water gets less harmful (b) BOD decreases (c) algae are destroyed (d) BOD increases
40. Volcano is _____ source of pollution.
 (a) artificial (b) natural (c) both (d) man-made
41. _____ is the first step of sewage treatment,
 (a) Precipitation (b) Chlorination (c) Sedimentation (d) Aeration
42. Which of the following is not an environmental problem ?
 (a) Wastage of water (b) Conservation of water (c) Deforestation (d) Land erosion
43. Which pollutants are responsible for bronchitis ?
 (a) O_2, CO_2 (b) CO, CO_2 (c) SO_2, NO_2 (d) Cl_2, H_2S
44. Primary pollutants used in the synthesis of photochemical smog are -
 (a) Unsaturated HCs (b) oxides of nitrogen (c) Ozone (d) Both a and b
45. Identify the correct matches -
 A. Environmental (protection) act, 1986 — Protection and quality improvement of air, water and soil.
 B. Kyoto protocol — To mitigate climate change, to reduce greenhouse gases
 C. Montreal protocol — ODS reduction
 D. Chipko movement — Trees protection
 (a) A, B (b) A, B, C (c) A, B, D (d) A, B, C, D
46. We and our surroundings together are called...
 (a) environment (b) atmosphere (c) lithosphere (d) hydrosphere
47. Which method is used to control pollutants of particulate nature ?

48. (a) Combustion (b) Absorption
(c) Electrostatic precipitators (d) Oxidation pond
There working, 'Eco San' toilets in any areas of-
- (a) Kerala (b) Bihar (c) Assam (d) Mumbai
49. Choose the odd one out w.r.t. ozone depletion in the stratosphere
(a) UV rays have the ability to both degrade as well as form ozone layer
(b) UV rays are depleting the good ozone in the troposphere
(c) CFC's are disturbing the balance of ozone equilibrium
(d) UV-B rays cause inflammation of cornea called snow blindness
50. **Column I** **Column II**
I. Arsenic (A) Minamata disease
II. Nitrate (B) Itai-itai
III. Mercury (C) Blue-baby syndrome
IV. Cadmium (D) Skeletal fluorosis
V. Fluoride (E) Black-foot disease
The correct matching is -
(a) I- B, II- A, III-D, IV-E, V-C
(b) I- D, II- A, III-B, IV-C, V-E
(c) I- C, II- B, III-D, IV-A, V-E
(d) I- E, II- C, III-A, IV-B, V-D
51. Concentration of DOT for first trophic level (phytoplanktons) and top trophic level (fish eating birds) is respectively in aquatic food chains if DOT is 0.003 ppb in water -
(a) 0.025ppm, 25ppm (b) 0.003 ppm, 2 ppm (c) 0.5ppm, 2 ppm (d) 0.04 ppm, 2 ppm
52. The diagram below shows the effect of polluting a river with untreated whey. What does graph X represent?
(a) bacterial count.
(b) number of fish.
(c) mass of curds.
(d) concentration of rennet.
- 
53. Read the following statements given here below and select the right answer
(A) Kyoto protocol, 1997 conference obtained commitments from different countries for reducing overall green house gas emission at level 5% below 1990 by 2008 - 2012
(B) Montreal protocol was signed in 1987
(C) Montreal protocol became effective in 1989
(D) Montreal protocol was signed to control the emission of ozone depleting substances.
(a) All are correct (b) All are wrong (c) All are correct except A (d) All are correct except C
54. After the conventional sedimentation, filtering and chlorine, lots of dangerous pollutants still remain. To combat this, the biologists developed a series of six connected marshes where appropriate plants, algae, fungi and bacteria were seeded into this area, which
(A) Neutralise the pollutants
(B) Absorb the pollutants
(C) Assimilate the pollutants

- (a) All are correct
(c) All are correct except B
55. **Column I**
I. DDT
II. PAN
III. Acid rain
IV. Global warming
The correct matching is-
(a) I- B, II- A, III-D, IV-C
(c) I- C, II- B, III-D, IV-A
- (b) All are wrong
(d) All are correct except C
- Column II**
(A) CO₂
(B) Smog
(C) Biological magnification
(D) SO₂
(b) I- D, II- A, III-B, IV-C
(d) I- D, II- C, III-A, IV-B
56. What was the focus of Rachel Carson's book Silent Spring in 1962?
(a) Rapid global warming resulting from fossil fuel burning and deforestation
(b) The potential for resource depletion leading to global poverty and starvation from increasing population growth
(c) The potential ecological devastation of pesticides such as DDT in the ecosystem
(d) Economic and social chaos resulting from a computer virus under a society with an over-concentration on technology and computers
57. The Ozone hole over Antarctica develops each year between
(a) Late August and early October
(b) Late October and early November
(c) Early July and Late October
(d) None of the above
58. The world summit on sustainable development held in 2002 in commitment to achieve by 2010. _____ countries pledged their
(a) Rio de Janeiro, 27
(b) Johannesburg (in South Africa), 190
(c) Rio de Janeiro, 190
(d) Johannesburg, 27
59. The thickness of ozone over poles changes with the season being lowest in
(a) Antarctic spring
(b) Polar autumn
(c) Antarctic autumn
(d) North hemisphere spring
60. Photochemical smog differs from classical / London smog in
(a) Having a reducing climate
(b) Its development during high temperature
(c) Not having polluting components of secondary origin
(d) Having SO₂ as major pollutant
61. In collaboration with which one, Ahmad Khan proved that blends of polyblend and bitumen, when used to lay roads, enhanced the bitumens' water repellent properties, and helped to increase roadlife by a factor of three.
(a) R. V. College of Engineering
(b) The Bangalore City Corporation
(c) Three Mile Island
(d) Both a and b
62. **Column I**
I. Nitrogen Oxide
II. Land Degradation
III. Wasteland
IV. Cyclone collectors
V. Sulphur Dioxide
The correct matching is -
- Column II**
(A) Water-logging
(B) Accumulation of Water in Alveoli
(C) Scratchy Throat and Smarting Eyes.
(D) Culturable and Unculturable
(E) Particulate Pollutants.

(a) I- B.II- A.III-D, IV-E.V-C

(b)I- D.II- A,III-B,IV-C,V-E

(c)I- C, II- B.III-D.IV-A.V-E

(d)I- E.II- C, III-A,IV-B,V-D

63. All automobiles and fuel-petrol and diesel-were to have met the Euro III emission specifications in some cities from 1 April 2005 and have to meet the Euro-IV norms by.
(d)1 April 2012 (a) 1 April 2008 (b) 1 April 2009 (c) 1Apr.il 2010
64. An international initiative taken in _____ to mitigate climatic changes and to reduce greenhouse emission is called_____
(a) 1987, Montreal Protocol (b) 1997, Kyoto Protocol
(c) 1992, Earth Summit (d) 1985, Vienna Convention
65. How much of the e-wastes generated in the, developed world are exported to developing countries
(a) Half (b) Less than half (c) Over half (d) One third.
66. Amrita Devi Bishnoi Wildlife protection Award is given to the individuals or communities from
(a) Rural areas (b) Urban areas (c) NGOs (d) None of the above.
67. Biomagnification refers to increase in concentration of the toxicant at successive trophic levels, this happens because
(a) A toxic substance accumulated by an organism can not be metabolised
(b) A toxic substance accumulated by an organism can not be excreted
(c) A toxic substance passed on to the next higher trophic level
(d) All of the above.
68. As the exhaust passes through the catalytic converter
(a) HCs are converted into CO and H₂O (b) Nitric oxides are changed to N₂ and CO
(c) CO and HCs are removed by oxidation (d) NO and NO₂ are converted to CO₂ and HCs
69. Heavy metals defined as elements with density _____ are harmful to ecological systems
(a)>1g/cm³ (b)>2g/cm³ (c) > 4g / cm³ (d)>5g/cm³
70. **Column I** **Column II**
I. Carbon Monoxide (A) Qu tative Pollutant
II. DDT (B) Feron
III. Chlorofluoromethane (C) Lung Cancer
IV. Smoking (D) Quantitative Pollutant
V. Acid rain (E) Nitrogen and Sulphur oxides.
- The correct matching is -
(a) I - B, II - A, III - D, IV - E, V – C (b)I- D.II- A.III-B.IV-C.V-E
(c)I- C, II- B.III-D, IV-A.V-E (d)I- E, II- C, III-A, IV-B.V-D
71. I. Part of ozone is destroyed over poles during polar spring.
II. Ozone present in stratosphere filters out UV-B.
III. Ozone hole over Antarctica was first detected by Farman et at.
IV. Ozone hole over Antarctica appears during August, September.
V. CFCs split up in stratosphere to release chlorine by the action of UV-C.
Which of the above statements is false?
(a)All (b)None (c) land II (d)III and V

72. The device on an automobile that filters harmful pollutants out of the exhaust before it enters the air is a[n] _____.
- (a) radiator (b) catalytic converter (c) carburetor (d) alternator
73. Which one is correct?
- (a) The second law of thermodynamics results in the phenomenon of biomagnification, the accumulation to toxic levels in aquatic food chains of persistent biodegradable toxins such as DDT.
- (b) Modern agricultural practices result in water pollution as nitrogenous fertilizer runoff into surrounding freshwater ecosystems can accelerate eutrophication.
- (c) "Blue-baby syndrome" results when nitrogenous fertilizers contaminate drinking water and the nitrates combine with hemoglobin within an infant's red blood cells.
- (d) All
74. Which of the following is not a major positive feedback mechanism in which the activity of humans to increase global climate temperatures leads to an even further increase?
- (a) Global warming causes increased rainfall, plant growth and photosynthesis
- (b) Global warming causes increased CO₂ release from biomass decomposition
- (c) Tropical deforestation causes warming and drying so that remaining forests begin to decline
- (d) Global warming causes snow to melt in polar regions and therefore increases global albedo
75. Some organic waste pollutants are of recent concern because they can act as endocrine disruptors which means they
- (a) cause permanent neurological damage (b) lead to birth defects
- (c) affect normal sexual development (d) are allergens
76. While CO₂ is the best known global warming gas, _____ is accumulating twice as fast and absorbs 20-30 times more heat than carbon dioxide.
- (a) nitric oxide (b) ozone (c) sulfur dioxide (d) methane
77. Which of the following is considered the greatest problem associated with the use of pesticides?
- (a) The speed with which they kill pest organisms
- (b) Modern pesticides are more dangerous to use
- (c) Development of genetic resistance in pest organisms
- (d) They increase costs for farmers, making it more difficult for them to make a living
- Fill up the blanks-
- A. _____ disposal into a water without proper treatment may cause outbreak of serious diseases, such as, dysentery, typhoid, jaundice, cholera, etc.
- B. High concentrations of I disturb II metabolism in birds, which causes thinning of eggshell and their premature breaking, eventually causing decline in bird populations.
- C. Without greenhouse effect the average temperature at surface of Earth would have been a chilly I _____ rather than the present average of 15°C.
- D. Presence of large amounts of nutrient in waters also causes excessive growth of free-floating I _____ called an _____ bloom which imparts a distinct colour to the water bodies. _____ cause deterioration of the water quality and fish mortality. Some bloom-forming algae are extremely toxic to human beings and animals.
- (a) A-1-Sewage; B-I-DDT, II-calcium; C-1--18°C, II; D -1 - phytoplanktons, II-algal, III-Algal blooms
- (b) A-1-DDT; B-1-Sewage, II -calcium; C-I --18°C, II; D -1 - planktons, II-algal, III-Algal blooms

- (c) A-1-Sewage; B-I-DDT, II -fat; C-1 --18°C, II; D-1-planktons, II-algal, III-Algal blooms
 (d) A-1-Sewage; B-I-DDT, II -calcium; C-I --18°C, II; D -1 - zooplanktons, II-animal, III-Zoo blooms
78. Which of the following contributes to both global warming and ozone thinning?
 (a) Carbon dioxide (b) Nitrous oxide (c) Methane (d)CFCs
79. Which statement(s) is/are false?
 A. In marine ecosystems, UV radiation can damage the tiny single-celled plants known as phytoplankton (which form the basis of the food chain).
 B. 5th June is World Environment Day
 C. Drinking mineral water / aerated drink with low levels (-0.02 ppm) of pesticide for long period would pesticide accumulation in the body
 D. NEERI (National Environmental Engineering Research Institute) is at Nagpur.V
 E. Chernobyl nuclear tragedy occurred in April, 1986.
 F. Bhopal gas tragedy of 1984 took place because methyl isocyanate reacted with water.
 G. Lead concentration of blood is considered alarming at 30 jig/100 ml.
 H. CO₂, CH₄, N₂O, CFCs are called green house gases because they can absorb long wave infrared radiations.
 I. High amount of *Escherichia coli* in water is an indicator of sewage / faecal pollution.
 J. Ozone, chlorine, chloramine are passed through swimming pool because it acts as disinfectant.
 K. Noise pollution does not have any residue. Noise pollution creates nervous disorder
 L. If there was no CO₂ in the atmosphere, the earth's temperature would be less than the present.
 (a) All except J and K (b) All except B, D and H (c) All except C, E and G (d) None
80. Which of the following statements about eutrophication are TRUE?
 1. It can be a naturally occurring process.
 2. It is common in standing water rather than running water
 3. It can lead to oxygen depletion
 4. It is commonly associated with high levels of nitrates and sulphates
 5. It is commonly associated with high levels of phosphates and nitrates.
 (a) all of them (b) 1, 2, 3 & 4 only (c) 2, 3, & 4 only (d) 1, 2, 3, & 5 only.
81. The addition of sewage and other organic material into a water supply _____.
 (a) increases oxygen consumption by decomposers (b) increases biological oxygen demand
 (c) causes an oxygen sag downstream (d) all of the above
82. What did Chernobyl, Three Mile Island, the Love Canal, and Bhopal, India all have in common?
 (a) They qualified as technological disasters.
 (b) They all involved environmental racism.
 (c) They were environmental problems caused by economic development.
 (d) They were all nuclear disasters.
83. You can protect yourself from too much exposure to UV radiation by taking two of the following precautions. Which two?
 (a) wear sunscreen with both UVA and UVB protection
 (b) wear clothing to prevent UV radiation from penetrating your skin
 (c) avoiding sunlight during peak UV hours

- (d) both a and c
84. What contributes the most to acid rain?
 (a) Forest fires (b) Car Exhaust (c) Coal Power Plants (d) None of the above
85. Which of the following is not one of the major environment problems resulting from human interference in the nitrogen cycle?
 (a) Nitrous oxide release increases global warming (b) Increased acid rain
 (c) Eutrophication (d) Stratospheric ozone depletion
86. The thickness of ozone in the column of air from the ground to top of the atmosphere is measured in terms of -
 (a) Angstrom units (b) Svedberg units (c) Dobson units (d) Decibel units
87. The ozone in the earth's atmosphere screens out:
 (a) space dust (b) meteors
 (c) UV radiation from the sun (d) smog
88. Which of the following is not a greenhouse gas?
 (a) $V^{terx/apJouf}$ (b) Methane (c) Carbon Dioxide (d) Calcium Carbonate
89. What part of the atmosphere contains the ozone layer? i.e. - where is most of the ozone?
 (a) troposphere (0-15 km) (b) stratosphere (15-50 km)
 (c) mesosphere (50-80 km) (d) thermosphere (above 80 km)
90. Which of the following is not one of the prime health risks associated with greater UV radiation through the atmosphere due to depletion of stratospheric ozone?
 (a) Increased liver cancer ; (b) Increased skin cancer
 (c) Damage to eyes (d) Reduced immune system
91. Temperature inversions, heat islands, and dust domes are the result of _____.
 (a) El Nino (b) ozone depletion (c) urban pollution (d) acid rain
92. The phenomenon where cool, dense air sits under a layer of lighter warmer air is known as a
 (a) temperature inversion (b) heat island (c) heat sink (d) Milankovitch cycle
93. I. Montreal Protocol was signed in 1987.
 II. Earth summit 1992 was held at Rio-de-Janeiro.
 III. World Environment Day is 5 June.
 IV. World Environment Day coincides with commemoration of First United Nations Conference on Human Environment
 V. At Do below 4 mg/L, water at normal temperature is heavily polluted.
94. Secondary sewage treatment-
 (a) Utilizes aerobic bacteria
 (b) Removes virtually all radioisotopes and toxic metals
 (c) Is too expensive to be used in most plants
 (d) Is a mechanical process
95. Fill up the blanks -
 A. Clouds and gases reflect about ____! ____ of the incoming solar radiation, and absorb some of it but almost half of incoming solar radiation falls on Earth's surface heating it, while a small proportion is reflected back. Earth's .

surface re-emits heat in the form of. II radiation but part of this does not escape into space as atmospheric gases (e.g., carbon dioxide, III, etc.) absorb a major fraction of it.

B. During the past century, the temperature of Earth has increased by I most of it during the last three decades. Scientists believe that this rise in temperature is leading to deleterious changes in the environment and resulting in odd climatic changes (e.g. II). thus leading to increased melting of polar ice caps as well as of other places like the Himalayan snow caps.

C. In human eye, cornea absorbs UV-B radiation, and a high dose of UV-B causes inflammation of cornea, called I cataract, etc. Such exposure may permanently damage the cornea.

(a) A-1 - one-fourth, II - infrared, III - methane; B -1 - 0.6°C, II - El Nino effect; C -1 - snow-blindness

(b) A-1 - three-fourth, II - red, III - methane; B -1 - 0.6°C, II - El Nino effect; C -1 - snow-blindness

(c) A-1 -one-fourth, II - infrared, III - methane; B -1 - 0.6°C, II - Emersion effect; C -1 - snow-blindness

(d) A-1 - one-fourth, II - red, III - methane; B -1 - 0.6°C, II - El Nino effect; C -1 - colour-blindness

96. What part of the CFC molecule attacks ozone?

(a) The hydrogen

(b) The fluorine

(c) The chlorine

(d) The carbon

97. Which of the above statements is correct?

(a) All

(b) All except IV

(c) All except II and III

(d) None

98. Since the Montreal Protocol was signed —

(a) CFC production has increased

(b) CFC level in the troposphere have decreased significantly

(b) The ozone layer has recovered

(d) Production of methyl bromide, halon and MFCs has fallen

99. The Kyoto Protocol specifies regulations on the emission of greenhouse gases. It defines a term known as "Carbon-Credits". The following statements pertain to Carbon-Credits:

(i) The mandatory limit of Carbon-Credit for each country is directly proportional to its size and population.

(ii) One Carbon-Credit defines the emission of one ton of carbon .dioxide or equivalent gases responsible for greenhouse effect

(iii) Carbon-credits are exchangeable among countries/industries.

(iv) An industry emitting higher than prescribed limit can do so by purchasing Carbon-Credits.

100. One of the consequences of El Nino is a decline in the number offish caught along the coasts of Ecuador and Peru. This decline is primarily because:

(a) of poor weather conditions.

(b) of increased s nity of surface waters along the coast.

(c) warmer water attracts more predators (for example, dolphins and seals).

(d) cold nutrient-rich water does not upwell to the surface along the coast.

101. Fill up the blanks-

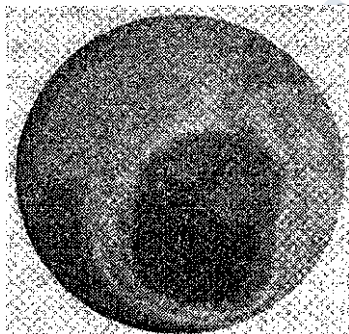
A. I were adopted as the substitute for open-burning dumps. In a

II .wastes are dumped in a depression or trench after compacting and covered with dirt everyday.

B. Deforestation is the conversion of forested areas to non-forested ones. According to an estimate, almost I percent forests have been lost in the tropics, compared to only II percent in the temperature region. Thi present scenario of deforestation is particularly grim in Indian At the beginning of the twentieth century forest covered about III percent of the land of India. By the end of the century, it shrunk to IV persen whereas the National Forest Policy (1988) of India has recommended 33 percent forest cover for the plains and 6 percent for the hills. —

- (a) A -1 - sanitary landfills, II - sanitary landfill; B - I - 40, II -1, III - 30, IV -19.4
 (b) A-1 -sanitary landfills, II-sanitary landfill; B-I-20, II -1, III -15, IV-19.4
 (c) A-1 - sanitary landfills, II - sanitary roadfill; B -1 -10, II -1, III - 5, IV -19.4
 (d) A-1 - sanitary roadfills, II - sanitary landfill; B -1 - 40, II -1, III - 30, IV -19.4

102. Identify the below figure -



- (a) Greenhouse effect (b) El Nino Effect (c) Ozone hole (d) Marsh meadow stage
103. UV radiations is injurious to plants because it-
 (a) Break phosphate bonds (b) Increases respiration (c) Causes dehydration (d) Causes genetic changes
104. Pollution of big cities can be controlled to large extent by-
 (a) Wide roads and factories away from city
 (b) Cleanliness drive and proper use of pesticides
 (c) Proper sewage and proper exit of chemicals from factories
 (d) All of the above
105. Which of the above statements are true?
 (a) (i) and (ii) only. (b) (ii) and (iv) only. (c) (ii), (iii), and (iv) only. (d) (i), (ii), and (iv) only.
106. Among the following environmental pollutants has the problem of biomagnifications-
 (a) SO_2 (b) NO_3 (c) Hg fungicides (d) O_3 & CO_2
107. The compound mainly responsible for pollution which caused the ill fameo¹ Bhopal gas tragedy was-
 (a) NH_4OH (b) CH_3NCO (c) $\text{CH}_3\text{NH}_2\text{O}$ (d) CHCl_3
108. The term activated sludge is used for a common secondary treatment technique because
 (a) it requires many workers, who are actively engaged in maintaining the system.
 (b) it is continually stirred and therefore activated.
 (c) it is very short lived, and therefore active compared to primary treatment.
 (d) j it involves use of a mixture of detritus-feeding organisms and is thus activated.
109. Which of the following air pollutants has shown the greatest decline in recentyears? ; rv - v ;,
 (a) lead (b) nitrogen oxides (c) carbon monoxide (d.) sulfur dioxide
110. The domestic sewage in large cities:
 (a) has a high BOD as it contains both aerobic and anaerobic bacteria
 (b) is processed by aerobic and then anaerobic bacteria in the secondary treatment in Sewage Treatment Plants (STPs)

- (c) When treated in STPs does not really require the aeration step as the sewage contains adequate oxygen.
 (d) has very high amounts of suspended solids and dissolved salts
111. Which one of the following statements is wrong in case of Bhopal tragedy?
 (a) It took place in the night of December 2/3/1984 (b) Methyl Isocyanate gas leakage took place
 (c) Thousands of human beings died (d) Radioactive fall out engulfed Bhopal
112. Lichens indicate SO_2 pollution because they -
 (a) Show association between algae and fungi (b) Grow faster than others
 (c) Are sensitive to SO_2 (d) Flourish in SO_2 rich environment
113. In an area where DDT had been used extensively, the population of birds declined significantly because:
 (a) birds stopped laying eggs (b) earthworms in the area got eradicated
 (c) cobras were feeding exclusively on birds (d) many of the birds laid, did not hatch
114. Measuring Biochemical Oxygen Demand (BOD) is a method used for:
 (a) estimating the amount of organic matter in sewage water.
 (b) working out the efficiency of oil driven automobile engines.
 (c) measuring the activity of *Saccharomyces cerevisiae* in producing curd on a commercial scale.
 (d) working out the efficiency of R.B.Cs. about their capacity to carry oxygen.
115. Which one of the following expanded forms of the followings acronyms is correct?
 (a) IUCN = International Union for Conservation of Nature and Natural Resources
 (b) IPCC = International Panel for Climate Change
 (c) UNEP = United Nations Environmental Policy
 (d) EPA = Environmental Pollution Agency
116. If a water body is contaminated with a toxicant, its biomagnification will be more marked in
 (a) water (b) planktons (c) small fishes (d) birds.
117. The ideal modern sewage bysystem is one in which v
 (a) sanitary sewage water is collected and treated, but storm water is not.
 (b) individual home owners operate private septic systems on large lots.
 (c) all sanitary sewage water and storm water is collected in a single sewer system and treated in a single treatment plant.
 (d) all sanitary sewage water is collected separately from storm water and fully treated to remove all pollutants before the water is release to natural systems.
118. Mass of living matter at a trophic level in an area at any time is called
 (a) Standing state (b) Standing crop (c) Detritus (d) Humus
119. Which one of the following is a wrong statment?
 (a) Most of the forests have been lost in tropical areas.
 (b) Ozone in upper part of atmosphere is harmful to animals.
 (c) Greenhouse effect is a natural phenomenon.
 (d) Eutrophication is a natural phenomenon in freshwater bodies.
120. Eutrophication is often seen in
 (a) Mountains (b) Deserts (c) Fresh water lakes (d) Ocean

121. Which of the following is a chlorofluorocarbon?
 (a) CFSO₂ (b) CF₂Cl₂ (c) FCICO₂ (d) ClF₂C
122. Environment Protection Act, to protect and improve the quality of our environmental air, water and soil was passed in the year
 (a) 1971 (b) 1974 (c) 1981 (d) 1986.
123. Which of the following is not an approved method of land disposal for hazardous-wastes?
 (a) secure landfills (b) burial of small containers on industrial sites
 (c) surface impoundments (d) deep-well injection
124. Which of the following fish is introduced in India by foreigners-
 (a) Labeo (b) pangas (c) Mystus (d) Clarias
125. Kyoto Protocol was endorsed at-
 (a) PoP-5 (b) CoP-6 (c) CoP-4 (d) CoP-3
126. Global warming can be controlled by-
 (a) Reducing reforestation, increasing the use of fossil fuel
 (b) Increasing deforestation, slowing down the growth of human population
 (c) Increasing deforestation, reducing efficiency of energy usage
 (d) Reducing deforestation, cutting down use of fossil fuel
127. Nowadays, biological reserves are commonly destroyed by-
 (a) Pollution (b) Population (c) Rain (d) None of these
128. One impediment to the use of treated sludge as agricultural fertilizer is
 (a) excess nitrogen in sludge could be toxic to plants.
 (b) possible disease outbreaks in livestock grazing on treated lands.
 (c) in some instances the sludge may contain high levels of toxic metals.
 (d) the potential for groundwater contamination with pathogens.
129. _____ is an American cockroach introduced in India through food ships and has now been fast replacing on native species of cockroaches.
 (a) Partherium hysterophilus (b) Blatta orientalis
 (c) Clarias bacterachus (d) Periplaneta Americana
130. The Air Prevention and Control of Pollution Act came into force in-
 (a) 1981 (b) 1985 (c) 1990 (d) 1975
131. In the Minamata Bay of Japan, the animals which remained free from Minamata disease are
 (a) Pigs (b) Dogs (c) Rabbits (d) cats

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	c	b	b	a	a	c	d	b	a	b	a	b	a	a	b	c	a	a	c	c
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	c	a	b	c	d	a	a	a	d	d	c	a	c	b	b	d	c	a	d	b
Ques.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	c	b	c	d	d	a	c	a	b	d	a	a	a	a	c	c	a	b	a	b
Ques.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	d	a	c	b	d	a	d	c	d	b	b	b	d	a	c	d	a	d	d	d
Ques.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	d	a	d	b	d	c	c	d	b	a	c	a	a	c	a	c	d	c	c	d
Ques.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	a	c	d	d	c	c	b	d	a	b	d	c	d	a	a	d	d	b	b	c
Ques.	121	122	123	124	125	126	127	128	129	130	131									
Ans.	b	d	b	c	d	d	a	b	d	a	c									