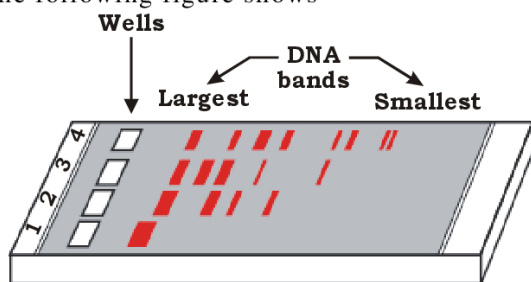


- In PCR, DNA is amplified about 10^9 times, when cycle is repeated by
(A) 30 times (B) 1 time
(C) 1 billion times (D) 1 million time.
- The sequence of events by which a cell duplicates its genome, synthesises the other constituents of the cells and eventually divides into two daughter cells is called
(A) Cell division (B) Cell cycle
(C) Karyokinesis (D) Cytokinesis.
- Which is the palindromic nucleotide sequence
(i) GAATTC (ii) AGGCCT
CTTAAG TCCGGA
(iii) CAGTCG
GTCAGC
(A) i, ii and iii (B) i and ii
(C) i only (D) i and iii.
- The following figure shows



- Polymerase chain reaction
 - Agarose gel electrophoresis
 - Downstream processing
 - Biolistics or gene gun.
- Nicotiana glauca* flowers only during long days and *N. glauca* flowers only during short days. If raised in the laboratory under different photoperiods, they can be induced to flower at the same time and can be cross-fertilized to produce self fertile offspring. What is the best reason for considering *N. glauca* and *N. glauca* to be separate species.
(a) They cannot interbreed in nature
(b) They are reproductively distinct
(c) They are physiologically distinct

- They are morphologically distinct.
- Select the wrong statement
(a) *Chlamydomonas* exhibits both isogamy and anisogamy and *Fucus* shows oogamy
(b) Isogametes are similar in structure, function and behaviour
(c) Anisogametes differ either in structure, function or behaviour
(d) In oomycetes, female gamete is smaller and motile while male gamete is larger and non-motile.
 - Which one represents the structural formula of basic amino acid

A	B	C	D
$\begin{array}{c} \text{NH}_2 \\ \\ \text{H}-\text{C}-\text{COOH} \\ \\ \text{CH}_2 \\ \\ \text{CH}_2 \\ \\ \text{C} \\ / \quad \backslash \\ \text{O} \quad \text{OH} \end{array}$	$\begin{array}{c} \text{NH}_2 \\ \\ \text{H}-\text{C}-\text{COOH} \\ \\ \text{CH}_2 \\ \\ \text{OH} \end{array}$	$\begin{array}{c} \text{CH}_2\text{OH} \\ \\ \text{CH}_2 \\ \\ \text{CH}_2 \\ \\ \text{NH}_2 \end{array}$	$\begin{array}{c} \text{NH}_2 \\ \\ \text{H}-\text{C}-\text{COOH} \\ \\ \text{CH}_2 \\ \\ \text{CH}_2 \\ \\ \text{CH}_2 \\ \\ \text{CH}_2 \\ \\ \text{NH}_2 \end{array}$

- A
 - B
 - C
 - D.
- Match the following and choose the correct combination

Column I	Column II
(a) Parenchyma gradient	(i) Maintaining pressure
(b) Sclerides	(ii) Gaseous exchange
(c) Lenticels	(iii) Isodiametric cells
(d) Companion cells	(iv) Highly thickened dead cells

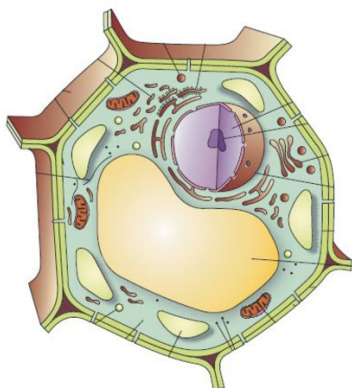
(a) a-iv, b-iii, c-ii, d-i	(b) a-iii, b-iv, c-ii, d-i
(c) a-ii, b-iv, c-i, d-iii	(d) a-iv, b-i, c-ii, d-iii.
 - Read the following statements and find out the incorrect statement.
(A) In an animal cell, cytokinesis is achieved by the appearance of a furrow in the plasma membrane

(B) Furrow formation starts in the centre of cell and grows outward to meet the existing lateral walls

(C) Cell plate represents the middle lamella between the walls of two adjacent plant cells

(D) During cytokinesis, organelles like mitochondria and plastids get distributed between the two daughter cells.

10. Identify the figure and select the correct statement



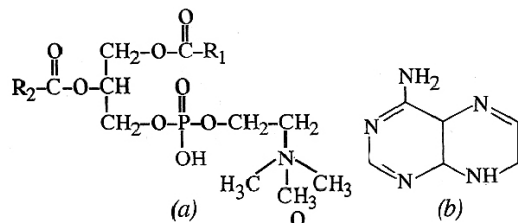
- (a) It is a plant cell
- (b) It is an animal cell
- (c) It is a prokaryotic cell
- (d) It is a bacterial cell.

11. Recombinant DNA technology involves several steps in specific sequence. Find out the correct sequence.

- a. Fragmentation of DNA
- b. Culturing the host cells in a medium at large scale
- c. Ligation of DNA fragment into a vector
- d. Extraction of the desired product
- e. Isolation of DNA
- f. Isolation of desired DNA fragment
- g. Transferring the recombinant DNA into the host.

- (A) e → a → f → g → c → b → d
- (B) e → f → a → c → g → b → d
- (C) a → e → c → f → g → d → b
- (D) e → a → f → c → g → b → d.

12. Which is correctly identified along with its function



- (A) b-uracil a component of DNA
- (B) a-lecithin a component of cell membrane
- (C) b-adenine a nucleotide that makes up nucleic acid
- (D) a- Triglyceride a major source of energy.

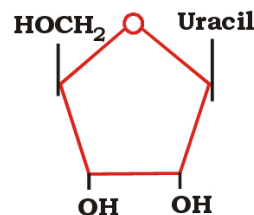
13. Meiosis involves

- (A) Two nuclear divisions and one chromosome division
- (B) One nuclear division and one chromosome division
- (C) One nuclear division and two chromosome divisions
- (D) Two nuclear divisions and two chromosome divisions.

14. One molecule of an enzyme is able to catalyse conversion of two molecules of substrate into products in 5 minutes. Ten molecules of enzyme and 25 molecules of substrate are mixed in a test tube. At the end of 5 minutes the test tube will have

- (A) Products only
- (B) Products and enzymes molecules
- (C) Products and 5 unreacted substrate molecules
- (D) Products, enzyme molecules and 5 molecules of substrate.

15. Identify the figure and select the incorrect statement

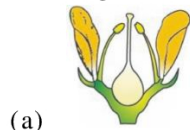


- (a) This is a nucleoside
- (b) This structure belongs to primary metabolites
- (c) This is named as uridine
- (d) This structure involves in the formation of both DNA and RNA.

16. Match the following and choose the correct combination

Column I
(Figure)

Column II
(Examples)



(a)

(i) Cotton



(b)

(ii) Pisum sativum



(c)

(iii) Primrose



(d)

(iv) Rose

(a) a-i, b-ii, c-iii, d-iv

(b) a-iv, b-i, c-iii, d-ii

(c) a-ii, b-iii, c-i, d-iv

(d) a-iii, b-i, c-iv, d-ii.

17. A non-protein organic part attached firmly by covalent linkage to apoenzyme is

- (A) Cofactor (B) Coenzyme
- (C) Prosthetic group (D) Activator.

18. In onion root tip during metaphase stage of mitosis the number of centromeres will be

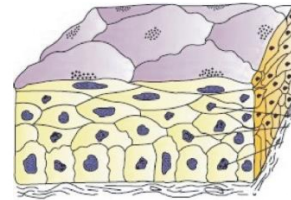
- (A) 4 (B) 8
- (C) 16 (D) 32.

19. If a recombinant DNA is inserted within the coding sequence of β -galactosidase enzyme then

- (A) Recombinant colonies will give blue colour in presence of chromogenic substrate.

- (B) Non-recombinant colonies will produce blue colour in presence of chromogenic substrate
- (C) Non-recombinant colonies will not produce colour due to insertional inactivation
- (D) Both recombinant and non-recombinant colours produce blue colour.

20. Select the correct statement about the figure



- (a) Gland, that secrete mucus, saliva, earwax and oil
- (b) Found in lining of stomach and intestine
- (c) Nuclei is located at base
- (d) Provides protection against chemical and mechanical stresses.

21. A bacteria divides in every one minute. A cup is filled in one hour. Time-taken to fill one-half cup is

- (A) 30 minutes (B) 59 minutes
- (C) 29 minutes (D) 58 minutes.

22. System of classification proposed by two botanists and claimed to be natural system is by

- (a) Bentham and Hooker
- (b) Aristotle and Theophrastus
- (c) Darwin and Wallace
- (d) Engler and Prantl.

23. 13-celled male gametophyte of Selaginella has

- (a) 12-celled antheridium +1 prothallial cell
- (b) 9-celled antheridium +4 prothallial cells
- (c) 7-celled antheridium +6 prothallial cells
- (d) 10-celled antheridium +3 prothallial cells.

24. The following figure represents the



- (a) Flower (b) Carpel
(c) Inflorescence (d) Thalamus.

25. In 'S phase' the amount of DNA

- (A) As well as number of chromosomes doubles in each cell
(B) Doubles but number of chromosomes remains same in each cell
(C) And number of chromosomes remain unchanged in each cell, but amount of protein doubles
(D) Remains same in each cell but number of chromosomes doubles.

26. Match the columns I and II, choose the correct combination from the options given

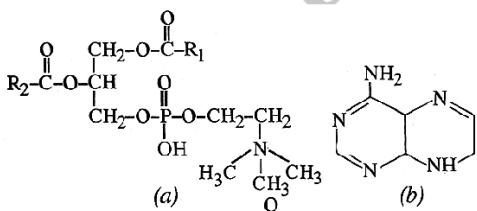
Column I

Column II

- | | |
|--|--------------------------|
| a. Tall and slender cells | K. Fallopian tube cells |
| b. Flattened cells with irregular boundaries | L. Duct of glands |
| c. Cilia on their free surface | M. Living of stomach |
| d. Cube like cells | N. Wall of blood vessels |

- (a) a-M, b-N, c-K, d-L
(b) a-K, b-L, c-M, d-N
(c) a-M, b-L, c-K, d-N
(d) a-M, b-N, c-L, d-K.

27. Which is correctly identified alongwith its function



- (A) b-uracil a component of DNA
(B) a-lecithin a component of cell membrane
(C) b-adenine a nucleotide that makes up nucleic acid
(D) a- Triglyceride a major source of energy.

28. Arrange the following events of meiosis in correct sequence

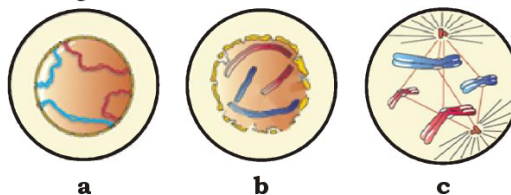
- (i) Crossing over
(ii) Synapsis
(iii) Terminalisation of chiasmata
(iv) Disappearance of nucleolus

- (A) (ii), (i), (iii), (iv) (B) (i), (ii), (iii), (iv)
(C) (ii), (iii), (iv), (i) (D) (ii), (i), (iv), (iii).

29. A somatic cell that has just completed the S phase of its cell cycle, as compared to gamete of the same species, has

- (A) Twice the number of chromosomes and four times the amount of DNA
(B) Four times the number of chromosomes and twice the amount of DNA
(C) Twice the number of chromosomes and twice the amount of DNA
(D) Same number of chromosomes and twice the amount of DNA.

30. Recognise the figure and find out the correct matching



- (A) a-Early prophase, b-late prophase, c-transition to metaphase
(B) b-Early prophase, c-late prophase, a-transition to metaphase
(C) c-Early prophase, a-late prophase, b-transition to metaphase
(D) b-Early prophase, a-late prophase, c-transition to metaphase.

31. Construction of first recombinant DNA was done by using plasmid of

- (A) Salmonella typhimurium
(B) Escherichia coli
(C) Bacillus thuringiensis
(D) Yeast.

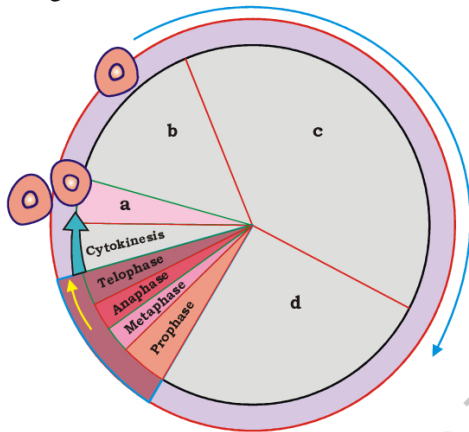
32. How many chromosomes will the cell have at it has G_1 , after S and after M-phase respectively if it has 14 chromosomes at interphase

- (A) 7, 14, 14 (B) 14, 14, 14
(C) 14, 14, 7 (D) 7, 7, 7.

33. A bivalent of meiosis I consists of

- (A) Four chromatids and two centromeres
(B) Two chromatids and one centromeres
(C) Two chromatids and two centromeres
(D) Four chromatids and four centromeres.

34. Recognise the figure and find out the correct matching

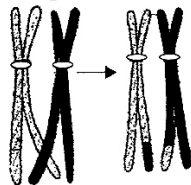


- (A) a- G_1 , b-S, c- G_2 , d-M
(B) a-M, b- G_1 , c-S, d- G_2
(C) a- G_1 , b-S, c- G_2 , d- G_0
(D) a- G_0 , b- G_1 , c-S, d- G_2 .

35. A common characteristic of all vertebrates is

- (a) Presence of skull
(b) Division of body into head, neck, trunk and tail
(c) Presence of two pairs of functional appendages
(d) Body is covered with an exoskeleton.

36. The given figure represents



(A) Prophase I

(B) Prophase II

(C) Prophase of mitosis

(D) Prophase and metaphase of mitosis.

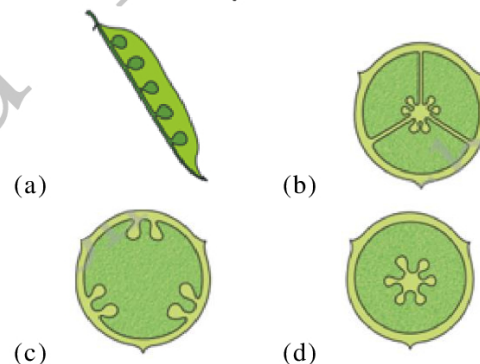
37. What is the fate of primary xylem in a dicot root showing extensive secondary growth?

- (A) It is retained in the centre of the axis
(B) It gets crushed
(C) May or may not get crushed
(D) If gets surrounded by primary phloem.

38. In the beginning of meiosis, a meiocyte has 32 pg of DNA. The amount in a gamete will be

- (A) 16 pg (B) 8 pg
(C) 4 pg (D) 32 pg.

39. In which figure the placenta form a single ridge along the ventral suture of the ovary and the ovules are borne on this ridge along the ventral suture of the ovary



40. Which one of the following statements is incorrect

- (A) The competitive inhibitor does not affect the rate of breakdown of the enzyme-substrate complex
(B) The presence of the competitive inhibitor decreases the K_m of the enzyme for the substrate
(C) A competitive inhibitor reacts reversibly with the enzyme to form an enzyme-inhibitor complex
(D) In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme.

Read the assertion and reason carefully to mark the correct option in question.

- (A) If both assertion and reason are true and the reason is the correct explanation of the assertion
- (B) If both assertion and reason are true but reason is not the correct explanation of the assertion
- (C) If assertion is true but reason is false.
- (D) If both assertion and reason are false.
41. Assertion : Mitotic cell division is also called equational division
Reason : Number of chromosomes in the parent and progeny cells is the same in mitosis.
42. Assertion : Co-enzymes serves as co-factors in a number of different enzyme catalysed reactions
Reason : Association of co-enzyme with the apoenzyme is only transient, usually occurring during the course of catalysis
43. Assertion : With the increases substrate concentration, the velocity of the enzymatic reactions rises at first. The reaction ultimately reaches a maximum velocity which is not exceeded by any further rise in concentration of the substrate

Reason : The enzyme molecule is fewer than substrate molecules and after saturation of these molecules, there are no free enzymes to bind with the additional substrate molecules

44. Assertion : Meiosis causes variations in population from one generation to the next

Reason : Variations are very important for the process of evolution

45. Assertion : If any piece of DNA is somehow transferred into an alien organism, most likely, this piece of DNA would not be able to multiply itself in the progeny cells of the organism.

Reason : For the multiplication of any alien piece of DNA in an organism it needs to be a part of a chromosome (s) which has a specific sequence known as origin of replication.

