

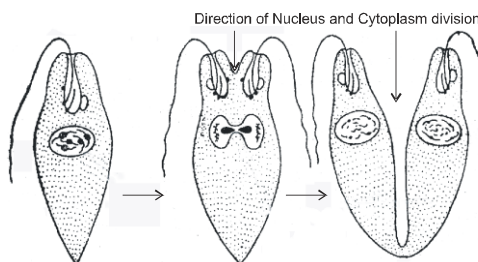
## Exercise-1

Marked Questions are for Revision Questions.

### ONLY ONE OPTION CORRECT TYPE

#### SECTION - A # ASEXUAL REPRODUCTION

1. Below diagram shows which method of reproduction?



- (1) Binary fission      (2) Fragmentation      (3) Budding      (4) Gemmule formation
2. Which of the following is immortal?  
 (1) Germ cells      (2) Pituitary cells      (3) Brain cells      (4) All of these
3. Natural parthenogenesis occurs in  
 (1) Honey bee      (2) All insects      (3) *Amoeba proteus*      (4) *Pheretima posthuma*
4. Unequal binary fission takes place in  
 (1) *Amoeba proteus*      (2) *Paramoecium caudatum*  
 (3) *Saccharomyces cerevisiae*      (4) *Euglena viridis*
5. The transverse binary fission occurs in  
 (1) *Hydra*      (2) *Euglena*      (3) *Paramoecium*      (4) *Amoeba*
6. Gemmulation is usually found in the  
 (1) Marine sponges      (2) Freshwater sponges  
 (3) Marine cnidarians      (4) Freshwater cnidarians
7. Isogamy is found in  
 (1) *Hydra*      (2) *Monocystis*      (3) *Planaria*      (4) *Plasmodium*
8. Asexual reproduction results in  
 (1) Rapid increase in number      (2) No genetic variability  
 (3) Production of clones      (4) All of the above
9. Multiple fission occurs in  
 (1) *Hydra*      (2) *Planaria*      (3) *Plasmodium*      (4) All of these
10. *Hydra* reproduces by budding. This is an example of  
 (1) Parthenocarp      (2) Regeneration  
 (3) Asexual reproduction      (4) Sexual reproduction
11. The development of an egg, without fertilization, is called  
 (1) Oogenesis      (2) Metagenesis      (3) Gametogenesis      (4) Parthenogenesis

12. ✖ Parthenogenesis is a type of  
 (1) Budding (2) Regeneration  
 (3) Sexual reproduction (4) Asexual reproduction
13. In honey bees, the drones are produced from  
 (1) Fasting larvae (2) Fertilized eggs  
 (3) Unfertilized eggs (4) Larvae fed upon royal jelly
14. ✖ The asexual reproduction is sometimes disadvantageous, as it  
 (1) Prevents animals from moving around to find mates in order to produce offspring  
 (2) Allows an animal to produce many offspring quickly  
 (3) Saves the time and energy required for gamete production  
 (4) Produces genetically uniform population
15. Which of the following are concerned with asexual reproduction?  
 (1) Buds (2) Gonads (3) Zygotes (4) Gametes
16. Plasmotomy involves  
 (1) Karyokinesis only (2) Cytokinesis only  
 (3) Karyokinesis followed by Cytokinesis (4) Cytokinesis followed by Karyokinesis
17. ✖ Budding is found in  
**A. Yeast B. Amoeba C. Hydra D. Sponge E. Rose plant**  
 (1) A, B and E (2) A, B, C and D (3) A, C, D and E (4) A, C and D

### SECTION - B # SEXUAL REPRODUCTION

1. Approximate ages of sexual maturity in boys & girls respectively are  
 (1) 10–14 years & 11 - 14 years (2) 8–11 years & 11 - 14 years  
 (3) 11–14 years & 14 - 16 years (4) 14–16 & 11-14 years
2. ✖ Which one of the following is not correctly matched?
- | <b>Animal</b>   | <b>Life span</b> |
|-----------------|------------------|
| (1) Horse       | 62 years         |
| (2) Lion        | 35 years         |
| (3) Parrot      | 140 years        |
| (4) Carp (fish) | 15 years         |
3. Menstrual cycle is not a characteristic of  
 (1) Chimpanzee (2) *Pangolin* (3) Orang-utan (4) *Rhesus*
4. ✖ Which one of the following is not monoecious?  
 (1) Earthworm (2) Star fish (3) Leech (4) *Taenia*
5. In oögamö, fertilization involves  
 (1) a large non-motile female gamete and a small motile male gamete  
 (2) a large motile female gamete and a small non-motile male  
 (3) a small non-motile female gamete and a large motile male gamete  
 (4) a large non-motile female and a small non motile male gamete
6. ✖ The fusion of two dissimilar gametes is known as  
 (1) Allogamy (2) Autogamy (3) Anisogamy (4) Paedogenesis

## MISCELLANEOUS QUESTIONS

1. It can regenerate entire alimentary canal.  
(1) Amphibian                      (2) Fish                      (3) Sea cucumber                      (4) Birds
2. A clone is  
(1) a group of genetically similar organisms produced through asexual reproduction  
(2) a group of genetically similar organisms produced through sexual reproduction  
(3) a group of genetically dissimilar organisms produced as a result of asexual reproduction  
(4) a group of genetically dissimilar organisms produced as a result of sexual reproduction
3. In which one pair both the plants can be vegetatively propagated by leaf pieces?  
(1) *Bryophyllum* and *Kalanchoe*                      (2) *Chrysanthemum* and *Agave*  
(3) *Agave* and *Kalanchoe*                      (4) *Asparagus* and *Bryophyllum*
4. From which cell peripheral region of radicle is produced?  
(1) Vegetative cell                      (2) Hypophysis  
(3) Apical octant                      (4) Micropylar octant
5. Division in a bacterial cell is carried out through  
(1) Multiple fission                      (2) binary fission                      (3) budding                      (4) plasmotomy
6. Monocarpic plant  
(1) flowers twice in every year                      (2) bears only one type of flower  
(3) flowers once in every year                      (4) dies after flowering once in its life cycle
7. Exponential growth occurs in  
(1) yeast                      (2) asexual reproduction  
(3) bacteria                      (4) all of these
8. Synergids are  
(1) haploid                      (2) diploid                      (3) triploid                      (4) tetraploid
9. Comparable to angiosperms, which of the following algae exhibits diplontic life cycle?  
(1) *Spirogyra*                      (2) *Ectocarpus*                      (3) *Polysiphonia*                      (4) *Fucus*
10. Which one of the following processes results in the formation of clone of bacteria?  
(1) Binary fission                      (2) Conjugation                      (3) Transformation                      (4) Transduction
11. The type of pollination involving transfer of pollen from anther to the stigma of the same flower is known as  
(1) geitonogamy                      (2) xenogamy                      (3) autogamy                      (4) apogamy
12. In porogamy, pollen tube enters the ovule through the  
(1) chalazal end                      (2) integument                      (3) micropyle                      (4) ovary wall
13. Ovule integument gets transformed into  
(1) seed                      (2) fruit wall                      (3) seed coat                      (4) cotyledons

## Exercise-2

1. A few statements describing certain features of reproduction are given below:  
i. Gametic fusion takes place  
ii. Transfer of genetic material takes place  
iii. Reduction division takes place  
iv. Progeny have some resemblance with parents  
Select the options that are true for both asexual and sexual reproduction from the options given below:  
(1) i and ii (2) ii and iii  
(3) ii and iv (4) i and iii
2. The term 'clone' cannot be applied to offspring formed by sexual reproduction because:  
(1) Offspring do not possess exact copies of parental DNA  
(2) DNA of only one parent is copied and passed on to the offspring  
(3) Offspring are formed at different times  
(4) DNA of parent and offspring are completely different.
3. *Amoeba* and Yeast reproduce asexually by fission and budding respectively, because they are:  
(1) Microscopic organisms (2) Heterotrophic organisms  
(3) Unicellular organisms (4) Uninucleate organisms
4. A few statements with regard to sexual reproduction are given below  
i. Sexual reproduction does not always require two individuals  
ii. Sexual reproduction generally involves gametic fusion  
iii. Meiosis never occurs during sexual reproduction  
iv. External fertilisation is a rule during sexual reproduction  
Choose the correct statements from the options below:  
(1) i and iv (2) i and ii (3) ii and iii (4) i and iv
5. Given below are a few statements related to external fertilization. Choose the correct statements.  
i. The male and female gametes are formed and released simultaneously  
ii. Only a few gametes are released into the medium  
iii. Water is the medium in a majority of organisms exhibiting external fertilization  
iv. Offspring formed as a result of external fertilization have better chance of survival than those formed inside an organism  
(1) iii and iv (2) i and iii (3) ii and iv (4) i and iv
6. Which of the following statements, support the view that elaborate sexual reproductive process appeared much later in the organic evolution.  
i. Lower groups of organisms have simpler body design  
ii. Asexual reproduction is common in lower groups  
iii. Asexual reproduction is common in higher groups of organisms  
iv. The high incidence of sexual reproduction in angiosperms and vertebrates  
Choose the correct answer from the options given below:  
(1) i and iii (2) i and ii (3) ii and iv (4) ii and iii

7. Offspring formed by sexual reproduction exhibit more variation than those formed by Asexual reproduction because:
- (1) Sexual reproduction is a lengthy process
  - (2) Gametes of parents have qualitatively different genetic composition
  - (3) Genetic material comes from parents of two different species
  - (4) Greater amount of DNA is involved in sexual reproduction.
8. Choose the correct statement from amongst the following
- (1) Dioecious (hermaphrodite) organisms are seen only in animals
  - (2) Dioecious organisms are seen only in plants
  - (3) Dioecious organisms are seen in both plants and animals
  - (4) Dioecious organisms are seen only in vertebrates
9. There is no natural death in single celled organisms like *Amoeba* and bacteria because:
- (1) They cannot reproduce sexually
  - (2) They reproduce by binary fission
  - (3) Parental body is distributed among the offspring
  - (4) They are microscopic
10. There are various types of reproduction. The type of reproduction adopted by an organism depends on:
- (1) The habitat and morphology of the organism
  - (2) Morphology of the organism
  - (3) Morphology and physiology of the organism
  - (4) The organism's habitat, physiology and genetic makeup
11. A multicellular, filamentous alga exhibits a type of sexual life cycle in which the meiotic division occurs after the formation of zygote. The adult filament of this alga has
- (1) haploid vegetative cells and diploid gametangia
  - (2) diploid vegetative cells and diploid gametangia
  - (3) diploid vegetative cells and haploid gametangia
  - (4) haploid vegetative cells and haploid gametangia
12. The male gametes of rice plant have 12 chromosomes in their nucleus. The chromosome number in the female gamete, zygote and the cells of the seedling will be, respectively,
- (1) 12, 24, 12                      (2) 24, 12, 12                      (3) 12, 24, 24                      (4) 24, 12, 24
13. The statements given below describe certain features that are observed in the pistil of flowers.
- i. Pistil may have many carpels
  - ii. Each carpel may have more than one ovule
  - iii. Each carpel has only one ovule
  - iv. Pistil have only one carpel
- Choose the statements that are true from the options below:
- (1) i and ii                      (2) i and iii                      (3) ii and iv                      (4) iii and iv
14. Which of the following situations correctly describe the similarity between an angiosperm egg and a human egg?
- i. Eggs of both are formed only once in a lifetime
  - ii. Both the angiosperm egg and human egg are stationary
  - iii. Both the angiosperm egg and human egg are motile transported
  - iv. Syngamy in both results in the formation of zygote
- Choose the correct answer from the options given below:
- (1) ii and iv                      (2) iv only                      (3) iii and iv                      (4) i and iv

15. Appearance of vegetative propagules from the nodes of plants such as sugarcane and ginger is mainly because:
- (1) Nodes are shorter than internodes (2) Nodes have meristematic cells  
(3) Nodes are located near the soil (4) Nodes have non-photosynthetic cells
16. Identify the incorrect statement.
- (1) In asexual reproduction, the offspring produced are morphologically and genetically identical to the parent  
(2) Zoospores are sexual reproductive structures  
(3) In asexual reproduction, a single parent produces offspring with or without the formation of gametes  
(4) Conidia are asexual structures in *Penicillium*
17. Which of the following is a post-fertilisation event in flowering plants?
- (1) Transfer of pollen grains (2) Embryo development  
(3) Formation of flower (4) Formation of pollen grains
18. The number of chromosomes in the shoot tip cells of a maize plant is 20. The number of chromosomes in the microspore mother cells of the same plant shall be:
- (1) 20 (2) 10 (3) 40 (4) 15

### Exercise-3

#### PART - I NEET / AIPMT QUESTION (PREVIOUS YEARS)

1. First successful animal clone was (AIPMT-2000)  
(1) Dolly goat (2) Dolly sheep (3) Molly goat (4) Molly sheep
2. Embryoids formed in tissue culture from pollen grain are due to (AIPMT-2002)  
(1) Test tube culture (2) Cellular totipotency  
(3) Organogenesis (4) Double fertilization
3. Binary fission is a type of (AIPMT-2003)  
(1) Vegetative propagation (2) Asexual reproduction  
(3) Sexual reproduction (4) Nuclear fragmentation
4. In which one pair both the plants can be vegetatively propagated by leaf segments? (AIPMT-2005)  
(1) *Agave* and *Kalanchoe* (2) *Bryophyllum* and *Kalanchoe*  
(3) *Asparagus* and *Bryophyllum* (4) *Chrysanthemum* and *Agave*
5. Vegetative propagation in Mint occurs by (AIPMT-2009)  
(1) Sucker (2) Runner (3) Offset (4) Rhizome
6. Vegetative propagation in *Pistia*/Water Hyacinth occurs by (AIPMT-2010, AMU-2013)  
(1) Sucker (2) Runner (3) Offset (4) Stolon

7. Common between vegetative reproduction and apomixis is (AIPMT Mains-2011)  
(1) Both applicable to dicots (2) Both bypass flowering phase  
(3) Both occur around the year (4) Both produce progeny identical to parent
8. Which is wrongly matched (AIPMT Mains-2011)  
(1) *Agave* – bulbils (2) *Penicillium* – conidia  
(3) Water Hyacinth – runner (4) *Bryophyllum* – leaf buds
9. Which one is common to multicellular fungi, filamentous algae and protonema of mosses (AIPMT-2012)  
(1) Diplontic life cycle (2) Members of kingdom plantae  
(3) Multiplication by fragmentation (4) Mode of nutrition
10. Which one represents male gamete (AIPMT-2012)  
(1) Antipodals (2) Synergids (3) Endosperm (4) Pollen grain
11. Monoecious plant of *Chara* shows occurrence of (NEET-2013)  
(1) Upper oogonium and lower antheridium on the same plant  
(2) Antheridiophore and archegoniophore on the same plant  
(3) Stamen and carpel on the same plant  
(4) Upper antheridium and lower oogonium on the same plant
12. Meiosis occurs in (NEET-2013)  
(1) Megaspore (2) Meiocyte (3) Conidia (4) Gemmule
13. Product of sexual reproduction generally generates (NEET-2013)  
(1) Large biomass (2) Longer viability of seeds  
(3) Prolonged dormancy (4) New genetic combinations leading to variations
14. Process of sexual reproduction which involves meiosis and syngamy is (NEET-2013)  
(1) Apomixis (2) Amphimixis (3) Agamospermy (4) Diplospory
15. A polyestrus animal is (NEET-2013)  
(1) Man (2) Cat (3) Rabbit (4) Horse
16. *Planaria* possesses high capacity of (AIPMT-2014)  
(1) Regeneration (2) Alternation of generations  
(3) Bioluminescence (4) Metamorphosis
17. Which one of the following is wrong about *Chara*? (AIPMT-2014)  
(1) Globule and nucule present on the same plant  
(2) Upper antheridium and lower oogonium  
(3) Globule is male reproductive structure  
(4) Upper oogonium and lower round antheridium.
18. Which one of the following shows isogamy with nonflagellated gametes? (AIPMT-2014)  
(1) *Ectocarpus* (2) *Ulothrix* (3) *Spirogyra* (4) *Sargassum*

19. Which one of the following in & generates new genetic combinations leading to variation? **(NEET-II-2016)**  
(1) Nucellar polyembryony (2) Vegetative reproduction  
(3) Parthenogenesis (4) Sexual reproduction
20. Offsets are produced by **(NEET-2018)**  
(1) Meiotic divisions (2) Parthenogenesis  
(3) Parthenocarp (4) Mitotic division
21. Offsets are produced by **(NEET-2018)**  
(1) Meiotic divisions (2) Parthenogenesis  
(3) Parthenocarp (4) Mitotic division

---

**PART - II AIIMS QUESTION (PREVIOUS YEARS)**

---

1. Grafting is not successful in monocots but is successful in dicots because they have **(AIIMS-2006)**  
(1) Vascular bundles arranged in a ring  
(2) Cambium for secondary growth  
(3) Vessels with elements arranged end to end  
(4) Cork cambium
2. A scion is grafted on a stock. Quality of fruits produced will depend upon genotype of **(AIIMS-2006)**  
(1) Scion (2) Stock (3) Both (1) and (2) (4) None of these
3. In which set of organisms does external fertilization occur **(AIIMS-2013)**  
(1) Echinodermata and mosses (2) Hemichordata and ferns  
(3) Amphibians and algae (4) Reptiles and gymnosperms
4. Gemmule formation is a common mode of asexual reproduction in **(AIIMS-2017)**  
(1) *Paramecium* (2) *Hydra* (3) sponges (4) yeast



# Answers

## EXERCISE - 1

### SECTION - A

- |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|
| 1. (1)  | 2. (1)  | 3. (1)  | 4. (3)  | 5. (3)  | 6. (2)  | 7. (2)  |
| 8. (4)  | 9. (3)  | 10. (3) | 11. (4) | 12. (4) | 13. (3) | 14. (1) |
| 15. (1) | 16. (2) | 17. (4) |         |         |         |         |

### SECTION - B

- |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|
| 1. (4) | 2. (4) | 3. (2) | 4. (2) | 5. (1) | 6. (3) |
|--------|--------|--------|--------|--------|--------|

## MISCELLANEOUS QUESTIONS

- |        |        |         |         |         |         |        |
|--------|--------|---------|---------|---------|---------|--------|
| 1. (3) | 2. (1) | 3. (1)  | 4. (2)  | 5. (2)  | 6. (4)  | 7. (2) |
| 8. (1) | 9. (4) | 10. (1) | 11. (3) | 12. (3) | 13. (3) |        |

## EXERCISE - 2

- |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|
| 1. (3)  | 2. (1)  | 3. (3)  | 4. (2)  | 5. (2)  | 6. (3)  | 7. (2)  |
| 8. (3)  | 9. (3)  | 10. (4) | 11. (4) | 12. (3) | 13. (1) | 14. (2) |
| 15. (2) | 16. (2) | 17. (2) | 18. (1) |         |         |         |

## EXERCISE - 3

### PART- I

- |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|
| 1. (2)  | 2. (2)  | 3. (2)  | 4. (2)  | 5. (1)  | 6. (3)  | 7. (4)  |
| 8. (3)  | 9. (3)  | 10. (4) | 11. (1) | 12. (2) | 13. (4) | 14. (2) |
| 15. (3) | 16. (1) | 17. (2) | 18. (3) | 19. (4) | 20. (4) | 21. (4) |

### PART- II

- |        |        |        |        |
|--------|--------|--------|--------|
| 1. (2) | 2. (1) | 3. (3) | 4. (3) |
|--------|--------|--------|--------|

**Self Practice Paper (SPP)**

1. Development of an organism from female gamete/egg without involving fertilization is
  - (1) Adventitive embryony
  - (2) Polyembryony
  - (3) Parthenocarp
  - (4) Partheonogenesis
2. A population of genetically identical individuals, obtained from asexual reproduction is
  - (1) Callus
  - (2) Clone
  - (3) Deme
  - (4) Aggregate
3. Syngamy means
  - (1) Fusion of gametes
  - (2) Fusion of cytoplasm
  - (3) Fusion of two similar spores
  - (4) Fusion of two dissimilar spores
4. Estrus cycle is indication of
  - (1) Breeding period
  - (2) Estrogen secretion
  - (3) Pregnancy
  - (4) Menopause
5. Monoestrus animals have
  - (1) One ovulation each month
  - (2) One egg
  - (3) One breeding season in a year
  - (4) One menses each month
6. For ovulation in reflex ovulators
  - (1) Coitus is necessary
  - (2) Coitus is not necessary
  - (3) Plenty of food is not necessary
  - (4) Plenty of food is necessary
7. Estrous cycle is characteristic of
  - (1) Human females
  - (2) Mammalian females
  - (3) Mammalian females other than primates
  - (4) Mammals
8. Individuals of a clone have
  - (1) Same age
  - (2) Same height
  - (3) Same genome
  - (4) Same number of leaves
9. Asexually produced organism inheriting all the characters of the parent is
  - (1) Offspring
  - (2) Clone
  - (3) Variety
  - (4) Hybrid
10. Apomixis is development of a new plant
  - (1) Without fusion of gametes
  - (2) From fusion products of gametes
  - (3) From stem cutting
  - (4) From root cuttings
11. An example of parthenogenesis in the development of fruit is the one
  - (1) With viable seeds after fertilization
  - (2) With viable seeds after pollination
  - (3) With viable seeds without fertilization
  - (4) Without seeds after pollination
12. Scion is the term used in relation to
  - (1) Embryology
  - (2) Grafting
  - (3) Agamospermy
  - (4) Emasculation

13. Clone is a group of individuals got through  
(1) Self pollination (2) Cross pollination  
(3) Vegetative propagation (4) Hybridisation
14. Which is not a method of vegetative propagation  
(1) Micropropagation (2) Budding (3) Sowing (4) Layering
15. Parthenogenesis is  
(1) Development of fruit without fertilization  
(2) Development of fruit with fertilization  
(3) Development of fruit without hormones  
(4) Development of embryo from egg without fertilization
16. Cellular totipotency was demonstrated by  
(1) Theodore Schwann (2) A.V. Leeuwenhoek  
(3) F. C. Steward (4) Robert Hooke
17. A totipotent cell means  
(1) An undifferentiated cell capable of developing into a system or entire plant  
(2) An undifferentiated cell capable of developing into an organ  
(3) An undifferentiated cell capable of developing into complete embryo  
(4) Cell which lacks the capability to differentiate into an organ or system.
18. A major use of embryo culture is in  
(1) Induction of somaclonal variations (2) Overcoming hybridisation barriers  
(3) Production of alkaloids (4) Clonal propagation
19. On culturing the young anther of a plant a botanist got a few diploid plant along with haploid plants. Which of the following might have given the diploid plants.  
(1) Exine of pollen grain (2) Vegetative cell of pollen  
(3) Cells of anther wall (4) Generative cell of pollen
20. Which ones produce androgenic haploids in anther cultures?  
(1) Anther wall (2) Tapetal layer of anther wall  
(3) Connective tissue (4) Young pollen grains
21. In Tobacco callus, which one shall induce shoot differentiation in combination of auxin and cytokinin?  
(1) Higher concentration of cytokinin and lower concentration of auxin  
(2) Lower concentration of cytokinin and higher concentration of auxin  
(3) only cytokinin and no auxin  
(4) Only auxin and no cytokinin
22. Which of the following plant cells will show totipotency  
(1) Sieve tubes (2) Xylem vessels (3) Meristem (4) Cork cells
23. Variations observed during tissue culture of some plants are known as  
(1) Clonal variations (2) Somaclonal variations  
(3) Somatic variations (4) Tissue culture variations

24. Virus free plants can be obtained by  
(1) Antibiotic treatment (2) Bordeaux mixture  
(3) Root tip culture (4) Shoot tip culture
25. Tissue culture technique can produce indefinite number of new plants from a small parental tissue. The economic importance of the technique is in raising.  
(1) Variants through picking up somaclonal variations  
(2) Genetically uniform population of an elite species  
(3) Homozygous diploid plants  
(4) Development of new species
26. External water is not required for fertilization of  
(1) Pteridophytes (2) Bryophytes (3) Thallophytes (4) Spermatophytes
27. A quicker regeneration of grass leaves shall occur by  
(1) Cutting (2) Grazing (3) Irrigation (4) Clipping
28. Grafting is not possible in monocots as they  
(1) Lack cambium (2) Are herbacious  
(3) Have scattered vascular bundles (4) Have parallel venation
29. A piece of Potato tuber will form a new plant if it has  
(1) Branches (2) Stored food (3) Roots (4) Scales/eyes
30. Layering is used for vegetative propagation of  
(1) Rose (2) Jasmine (3) Mango (4) All of these
31. Roots are used in vegetative propagation of  
(1) Ginger (2) Chrysanthemum (3) Sweet Potato (4) Potato
32. Stem cuttings are commonly used in propagation of  
(1) Mango (2) Cotton (3) Rose (4) Banana
33. Haploid plant cultures are got from  
(1) Leaves (2) Root tip (3) Pollen grain (4) Buds
34. Somaclonal variations are the ones  
(1) Caused by mutagens (2) Produced during tissue culture  
(3) Induced during sexual embryogeny (4) Caused by gamma rays
35. Parasexual hybridisation means fusion of  
(1) Male gamete with female gamete (2) Male gamete with synergid  
(3) Somatic protoplasts (4) Male gamete with somatic cell

36. Application of embryo cultures is in  
 (1) Clonal propagation (2) Overcoming hybridisation barrier  
 (3) Production of alkaloids (4) Formation of somaclonal variations
37. Plants developed in *vitro* culture from pollen grains are  
 (1) Androgenic haploids (2) Pollen plants  
 (3) Male plants (4) Sterile plants
38. In tissue/bacterial culture glassware and nutrients are sterilised through  
 (1) Water bath at 200°C (2) Dry air oven at 200°C  
 (3) Dehumidifier (4) Autoclave
39. Development of shoot and root in tissue culture is determined by  
 (1) Cytokinin and auxin ratio (2) Enzyme  
 (3) Temperature (4) Plant nutrients
40. Plant medium used widely in preparation of culture medium is got from  
 (1) *Cycas revoluta* (2) *Cocos nucifera*  
 (3) *Pinus roxburghii* (4) *Borassus flabellifera*
41. Mango and Guava are propagated through  
 (1) Tissue culture (2) Grafting (3) Stolons (4) Layering
42. *Chrysanthemum* multiplies vegetatively by  
 (1) Suckers (2) Runners (3) Stolons (4) Rhizomes
43. In vegetative propagation by tubers, which of following remains constant through generations  
 (1) Morphology (2) Vigour only  
 (3) Vigour and morphology only (4) Morphology, vigour and disease resistance
44. Induction of rooting on stems before separating them from parent plant is  
 (1) Grafting (2) Layering  
 (3) Cutting (4) Root-stem joint
45. Clonal cell lines are got from  
 (1) Tissue culture (2) Tissue fractionation  
 (3) Tissue homogenisation (4) Tissue system

**SPP Answers**

1.	(4)	2.	(2)	3.	(1)	4.	(1)	5.	(3)	6.	(1)	7.	(3)
8.	(3)	9.	(2)	10.	(1)	11.	(3)	12.	(2)	13.	(3)	14.	(3)
15.	(4)	16.	(3)	17.	(1)	18.	(2)	19.	(3)	20.	(4)	21.	(1)
22.	(3)	23.	(2)	24.	(4)	25.	(2)	26.	(4)	27.	(4)	28.	(1)
29.	(4)	30.	(2)	31.	(3)	32.	(3)	33.	(3)	34.	(2)	35.	(3)
36.	(2)	37.	(1)	38.	(4)	39.	(1)	40.	(2)	41.	(2)	42.	(1)
43.	(4)	44.	(2)	45.	(1)								