

Delhi Public School, Jammu
Question Bank
(2017 – 18)

Class : XI

Subject : Biology

Q1. Why growth and reproduction cannot be taken as defining property of all living organisms?

- Non-living things can also increase in mass by accumulation of material on surface.
- Many organisms do not reproduce (*e.g.*, mules, sterile worker bees).

Q2. What is the difference between Botanical Garden and Herbarium?

Botanical Garden: Collection of living plants.

Herbarium: Collection of dried, pressed and preserved plant specimens on sheets.

Q3. Give the characteristics features of kingdom Monera.

1. Has bacteria a sole member.
2. Bacteria can have shapes like : Coccus (spherical), Bacillus (rod-shaped), Vibrio (comma shaped) and spirillum (spiral shaped).
3. Bacteria's can be found everywhere.
4. Bacteria's can photosynthetic autotrophs or chemosynthetic autotrophs.

Q4. What are the different classes of fungi?

CLASSES OF FUNGI

(i) Phycomycetes :

- grow on decaying wood
- Mycelium septate
- Spores produced endogenously
- Asexual reproduction by Zoospores or Aplanospores

e.g., Rhizopus, Albugo.

(ii) Ascomycetes :

- Also known as 'sac fungi'
- Mycelium branched and septate
- Spores : Asexual spores are called conidia produced exogenously on the conidiophores.

Sexual spores are called ascospores produced endogenously in ascus produced inside fruiting body called Ascocarp.

e.g., Aspergillus, Neurospora.

(iii) Basidiomycetes

- Mycelium septate.
- Asexual spores generally are not found.
- Vegetative reproduction by fragmentation.
- Sexual reproduction by fusion of vegetative or somatic cells to form basidium produced in basidiocarp.
- Basidium produced four basidiospores after meiosis.

e.g., Agaricus, Ustilago.

(iv) Deuteromycetes

- Called as 'Fungi Imperfecti' as sexual form (perfect stage) is not known for them.
- Once sexual form is discovered the member is moved to Ascomycetes or Basidiomycetes.

- Mycelium is septate and branched.
- Are saprophytic, parasitic or decomposers.

e.g., Alternaria, Colletotrichum.

Q5. What are Viroids?

- Viroids :**
- Infectious agent, free RNA (lack protein coat)
 - RNA has low molecular weight.
 - Causes potato spindle tuber disease.
 - Discovered by T. O. Diener.

Q6. What are Lichens?

Symbiotic association between algal component (Phycobiont) and fungal component (Mycobiont). Algae provide food. Fungi provide shelter and absorb nutrients for alga.

Good pollution indicators as they do not grow in polluted areas.

Q7. Briefly, explain the alternation of generation in plants.

Alternation of generation: Haploid gametophytic and spore producing sporophytic generation alternate with each other in this process.

Haplontic: Gametophytic phase dominant. *e.g., Chlamydomonas*

Diplontic: Sporophytic phase dominant. *e.g., Angiosperms and Gymnosperms*

Haplo-Diplontic: Intermediate like stage where gametophytic and sporophytic stage partially dominate at different stages. *e.g., Bryophytes and Pteridophytes.*

Q8. How animals are classified on the basis of germinal layers?

Classification of animals on the basis of germinal layers:

Diploblastic: Cells arranged in two embryonic layers *i.e.* external ecto- derm and internal endoderm. (Mesoglea may be present in between ecto- derm and endoderm) *e.g.*, Coelentrates. (Cnidarians)

Triploblastic: Three layers present in developing embryo *i.e.*, ectoderm, endoderm and mesoderm. *e.g.*, Chordates.

Q9. What is a coelom? What are the different types of coelom?

Coelom: Body cavity which is lined by mesoderm is called coelom. **Coelomates:** Have true coelom *e.g.* Annelids, Chordates etc. **Pseudocoelomates:** No true coelom as mesoderm is present in scattered pouches between ectoderm and endoderm. *e.g.*, Aschelminthes.

Acoelomates : Body cavity is absent. *e.g.* Platyhelminthes.

Q10. Explain the structure of Viruses?

- Its a nucleoprotein made up of protein called Capsid. Capsid is made up of capsomeres arranged in helical or polygeometric forms. Have either DNA or RNA as genetic material which may be single or double stranded.
- Usually plant viruses have single stranded RNA; bacteriophages have double stranded DNA and animal viruses have single or double stranded RNA or double stranded DNA.

Q11. What are the characteristics features of cyclostomata?

- Have sucking and circular mouth without jaws.
 - Live as ectoparasites on some fishes.
 - No scales, no paired fins.
 - Cranium and vertebral column is cartilaginous.
 - Migrate to fresh water for spawning and die after spawning.
 - Larva returns to ocean after metamorphosis.
- e.g.*, Petromyzon.

Q12. What are the main features of phylum Chordata?

- Presence of Notochord
- Have dorsal hollow nerve chord.
- Have paired pharyngeal gill slits.

- Heart is ventral.
- Post anal tail present.

Q13. What are the features of class Aves which help them in flying?

Wings, bones long and hollow with air cavities, air sacs connected to lungs to supplement respiration.

Q14. Explain the different root and stem modifications.

1. Modifications of Root: Roots are modified for support, storage of food, respiration.

For support: Prop roots in banyan tree, stilt roots in maize and sugarcane.

For respiration: pneumatophores in *Rhizophora* (Mangrove).

For storage of food: Fusiform (radish), Napiform (turnip), Conical (carrot).

2. Stem modifications: In some plants the stems are modified to perform the function of storage of food, support, protection and vegetative propagation.

For food storage: Rhizome (ginger), Tuber (potato), Bulb (onion), Corm (colocasia).

For support: Stem tendrils of watermelon, grapevine, cucumber

For protection: Axillary buds of stem of citrus, *Bougainvillea* get modified into pointed thorns. They protect the plants from animals.

For vegetative propagation: Underground stems of grass, strawberry.

Q15. What are the different types of phyllotaxy?

Phyllotaxy: The pattern of arrangement of leaves on the stem or branch.

Types of phyllotaxy

Alternate	Opposite	Whorled
(Single leaf at a node)	(Two leaves at a node)	(More than two leaves in a whorl at a node)
e.g., China rose, Mustard	e.g., <i>Calotropis</i> , guava	e.g., Nerium, devil tree

Q16. 'Potato is a stem and sweet potato is a root.' Justify the statement on the basis of external features.

Potato is the swollen tip of an underground stem branch (stolon). It has nodes (eyes) which consist of one or more buds subtended by a leaf scar. Adventitious roots also arise during sprouting. On the other hand sweet potato is a swollen adventitious root (tuberous root). It has no nodes, internodes and buds like a stem.

Q17. Differentiate between actinomorphic and zygomorphic flowers.

Actinomorphic Flower

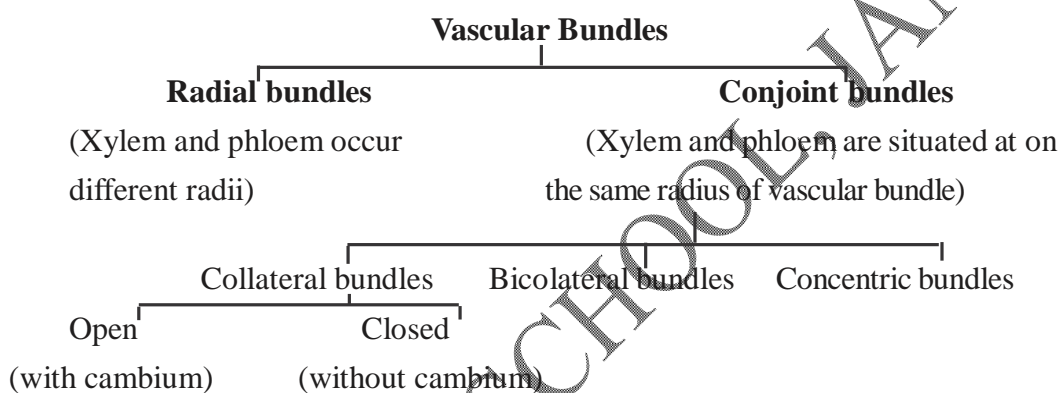
Zygomorphic flower

- (1) Two equal halves are formed any vertical division passing through the centre.
- (2) It has a radial symmetry.

- Two equal halves are produced by only one vertical division.
- It has a bilateral symmetry.

Q18. Write a short note on plant vascular system.

The vascular tissue system: It includes vascular bundles which are made up of xylem and phloem.



Q19. What is secondary growth in plants? Describe various steps of secondary growth in dicot stem with the help of diagrams.

Secondary growth in dicot stem: An increase in the girth (diameter) in plants. Vascular cambium and cork cambium (lateral meristems) are involved in secondary growth.

1. Formation of cambial ring : Intrafascicular cambium + interfascicular cambium.
2. Formation of secondary xylem and secondary phloem from cambial ring.
3. Formation of spring wood and autumn wood.
4. Development of cork cambium (phellogen).

Q20. Explain the circulatory and respiratory system of Cockroach.

Blood vascular system: Open type, visceral organs bathed in haemolymph (colourless plasma and haemocytes).

Heart consists of elongated muscular tube and differentiated into funnel-shaped chambers with ostia on either side. Blood from sinuses enters heart through ostia and is pumped anteriorly to sinuses again. Blood colorless (haemolymph).

Respiratory system: Network of trachea which open through 10 spiracles. Spiracles regulated by sphincters. Oxygen delivered directly to cells. Excretion and osmoregulation by Malpighian tubules; uricotelic (Uric acid as excretory product).

Q21. What is a satellite DNA? Classify chromosomes on the basis of the position of centromere.

Some chromosomes have non-staining secondary constrictions at a constant location, which gives the appearance of small fragment called satellite DNA.

Chromosomes (on basis of position of centromere):

Metacentric: Middle centromere.

Sub-metacentric: Centromere nearer to one end of chromosome.

Acrocentric: Centromere situated close to its end.

Telocentric: Has terminal centromere.

Q22. What are proteins? Classify proteins on the basis of their structure.

Proteins are heteropolymers of amino acids linked by peptide bond.

Different types of proteins on the basis of their structure:

(a) Primary structure: Is found in the form of linear sequence of amino acids. First amino acid is called N-terminal amino acid and last amino acid is called C-terminal amino acid.

(b) Secondary structure: Polypeptide chain undergoes folding or coiling which is stabilized by hydrogen bonding. Right handed helices are observed. e.g., fibrous protein in hair, nails.

(c) Tertiary structure: Long protein chain is folded upon itself like a hollow wollen ball.

Tertiary structure gives the 3-dimensional view of protein, e.g., myosin.

(d) Quaternary structure: Two or more polypeptides with their foldings and coilings are arranged with respect to each other. e.g., Human haemoglobin molecule has 4 peptide chains 2α and 2β subunits.

Q23. What are the factors effecting the functioning of the enzymes?

Factors affecting enzyme activity:

(a) Temperature: Show highest activity at optimum temperature. Activity declines above and below the optimum value.

(b) pH: Enzymes function in a narrow range of pH. Highest activity is shown at optimum pH.

(c) Concentration of substrate: The velocity of enzymatic reaction rises with increase in substrate concentration till it reaches maximum velocity (V). Further increase of substrate does not increase the rate of reaction as no free enzyme molecules are available to find with additional substrate.

Q24. What are the five different phases of Prophase I of Meiosis?

Prophase I is subdivided into 5 phases.

Leptotene :

- i) Chromosomes make their as single stranded structures.
- ii) Compaction of chromosomes continues.

Zygotene :

- i) Homologous chromosomes start pairing and this process of association is called synapsis.
- ii) Chromosomal synapsis is accompanied by formation of synaptonemal complex.
- iii) Complex formed by a pair of synapsed homologous chromosomes is called bivalent or tetrad.

Pachytene :

- i) Crossing over occurs between non-sister chromatids of homologous chromosomes.

Diplotene:

- i) Dissolution of synaptonemal complex occurs and the recombined chromosomes separate from each other except at the sites of crossing over. These X-shaped structures are called chiasmata.

Diakinesis:

- i) Terminalisation of chiasmata.
- ii) Chromosomes are fully condensed and meiotic spindles assembled.
- iii) Nucleolus disappear and nuclear envelope breaks down.

Q25. What is the significance of meiotic division?

Significance of Meiosis

1. Formation of gametes: In sexually reproducing organisms.
2. Genetic variability
3. Maintenance of chromosomal number: By reducing the chromosome number in gametes.