

Section-A

Multiple Choice Questions (MCQ's)

Q.1 Choose the correct answer for each from the given options:

1. Tendency of water to coalesce oil drop into large droplet called:
(a) Hydrophilic force (b) Hydrophobic exclusion
(c) Hydrophilic exclusion (d) Hydrogen bonding
2. The covalent bond between two monosaccharide is called:
(a) Peptide bond (b) Ester bond
(c) Phosphodiester bond (d) Glycosidic bond
3. Cell organelle mainly concerned with the detoxification of alcohol.
(a) Chloroplast (b) Peroxisome
(c) Central vacuole (d) Mitochondria
4. Clarity of image is generally known as:
(a) Magnification (b) Contrast
(c) Resolution (d) Sedimentation
5. Which structure is common to plant and animal cells?
(a) Chloroplast (b) Cell wall
(c) Central vacuole (d) Mitochondria
6. Cell organelle mainly concerned with the detoxification of alcohol.
(a) Chloroplast (b) Peroxisome
(c) Central vacuole (d) Mitochondria
7. Clarity of image is generally known as:
(a) Magnification (b) Contrast
(c) Resolution (d) Sedimentation
8. How many carbon atoms are fed into the citric acid cycle as a result of the oxidation of one molecule of pyruvate?
(a) 2 (b) 4 (c) 6 (d) 8

9. Which of the following is true about the Kingdom Protocista:
(a) All organisms are prokaryotes (b) All organisms are eukaryotes
(c) All organisms are autotrophic (d) All organisms are heterotrophic
10. All members of green algae have the pigment combination:
(a) Chlorophylls a and b (b) Chlorophylls a and c
(c) Chlorophylls a and Phycobilins (d) Chlorophylls a, b and c
11. The major grouping of protozoa is based upon their:
(a) Feeding habits (b) Mode of reproduction
(c) Mode of Nutrition (d) Mode of locomotion
12. The most important cellulose degraders in ecosystem are:
(a) Ascomycota (b) Zygomycota
(c) Basidiomycota (d) Deutromycota
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13. The dominant generation of living vascular plants existing as free-living plants is:
(a) Sporophyte (b) Gametophyte
(c) Tracheophyte (d) Pteridophyte
14. The most primitive living vascular plants is:
(a) Lycophyta (b) Sphenopyta
(c) Psilophyta (d) Filicinohyta
15. The gametophyte of Fern is called:
(a) Archegonium (b) Antheridium
(c) Cones (d) Prothallus
16. Pick the odd one out?
(a) Star fish (b) Brittle star
(c) Lamprey (d) Sea urchin

Section-B
(Short Questions)

Note: Answer any 08 questions of the following:

- Q.2 Why enzyme are called temperature sensitive?
- Q.3 Why mitochondria is called power house of cell?
- Q.4 Differentiate between peroxisome and glyoxome.
- Q.5 Why oxidation of pyruvate provide more energy than lactic acid fermentation?
- Q.6 Why asexual and sexual ulva plants are called as sporophyte and gametophyte?
- Q.7 Name various chasses of protozoa and hums each of their membrans move?
- Q.8 Why gymnosperms have naked seeds but not angiosperms?
- Q.9 Why flower is called a reproductive part of plans?
- Q.10 Why cold treatment is necessary for the germination of seed in some plants,
- Q.11 How osmotic adjustment is beneficial for plants.
- Q.12 Describe some of the unusual features of nuclear behavior in fungi?

Section-C
(Descriptive Question)

Note: Answer any 02 question of the following:

- Q.13 Describe the effect if temperature on the rate of enzyme action.
- Q.14 Describe the Structure and Function of Golgi complex.
- Q.15 Discuss cyclic and non-cyclic Photophosphorylation during light reaction.
- Q.16 Give diagnostic feature of four classes of Fungi?
- Q.17 Describe life cycle of moss with diagram

Section-A

Multiple Choice Questions (MCQ's)

Q.1 Choose the correct answer for each from the given options:

1. **All amino acids have same formula except.**
(a) Alpha carbon (b) Hydroxyl group
(c) Radical group (d) Amino group
2. **A trihydroxy alcohol, made of three carbon atoms called:**
(a) Glucose (b) Glycerol
(c) Maltose (d) Ribose
3. **Large and important class of lipid made up of isoprenoid unit called:**
(a) Phospholipid (b) Terpenoids
(c) Waxes (d) Acylglycerol
4. **According to the induced fit hypothesis of enzyme catalysis, which of the following is correct?**
(a) The binding of the substrate depends on the shape of the active site.
(b) Some enzymes change their structure when activators bind to the enzyme.
(c) A competitive inhibitor can out compete the substrate for the active site.
(d) The binding of the substrate changes the shape of the enzyme's active site.
5. **A series of enzymes catalyze $X \rightarrow Y \rightarrow Z \rightarrow A$. Product A binds to the enzyme that converts X to Y at a position remove from its active site. This binding decrease the activity of the enzyme. What is substance X?**
(a) A coenzyme (b) An allosteric inhibitor
(c) A substrate (d) An intermediate

6. If an enzyme is added to a solution where its substrate and product are in equilibrium, what would occur?
- (a) Additional product would be formed
 - (b) Additional substrate would be formed
 - (c) The free energy of the system would change
 - (d) Nothing; the reaction would stay at equilibrium
7. Which one of the following is the mechanism of action of enzymes?
- (a) They act upon substrate molecules to release new substrate molecules
 - (b) They actually increase the amount of energy of activation
 - (c) Enzymes dramatically decrease the amount of energy of activation
 - (d) Enzymes break product molecules to release new product molecules.
8. How does a noncompetitive inhibitor decrease the rate of an enzyme reaction?
- (a) By binding at the active site of the enzyme
 - (b) By changing the shape of a reactant
 - (c) By changing the free energy change of the reaction
 - (d) By acting as a coenzyme for the reaction.
9. A primary objective of cell fractionation is to:
- (a) View the structure of cell membranes
 - (b) Identify the enzymes outside the organelles
 - (c) Determine the size of various organelles
 - (d) Separate the major organelles so that their particular functions can be determined.

10. The volume enclosed by the plasma membrane of plant cells is often much larger than the corresponding volume in animal cells. The most reasonable explanation for this observation is that:

(a) Plant cells are capable of having a much higher surface to volume ratio than animal cells.

(b) Plant cells have a much more highly convoluted plasma membrane than animal cells.

(c) Plant cells contain a large vacuole that reduces the volume of the cytoplasm.

(d) Animal cells are more spherical, while plant cells are elongated.

11. Tay-Sachs disease is a human genetic abnormality in cells accumulating and becoming clogged with very large and complex lipids. Which cellular organelle must be involved in this condition?

(a) Endoplasmic reticulum

(b) Golgi complex

(c) Lysosome

(d) Mitochondria

12. Which is one of the main energy transformers of cells?

(a) Endoplasmic reticulum

(b) Golgi complex

(c) Lysosome

(d) Mitochondria

13. Organelles other than the nucleus that contain DNA.

I. Ribosomes

II. Chloroplast

III. Mitochondria

(a) I only

(b) II only

(c) II and III

(d) I and II

14. The intermediate carbon fixing compound in the member of grass family to pass CO_2 to calvin cycle is:

- (a) Citric acid
- (b) Oxaloacetic acid
- (c) Pyruvic acid
- (d) Crassulacean acid

15. Oxidative decarboxylation of isocitrate form?

- (a) α -ketoglutarate
- (b) Succinate
- (c) Cis-aconitate
- (d) Fumarate

16. Dry scaly kin, ectothermic, two pairs of legs, lungs, Internal Fertilization, eggs with amniotic shell, and a three chambered heart are all properties of which class?

- (a) Amphibia
- (b) Reptilia
- (c) Aves
- (d) Mammals

Section-B
(Short Questions)

Note: Answer any 08 questions of the following:

- Q.2 Why amino acids are named so?
- Q.3 Why fats provide more energy than carbohydrates?
- Q.4 Why enzymes are specific in nature?
- Q.5 Define structure of enzyme.
- Q.6 Why plant cell wall is rigid?
- Q.7 Explain the economic importance of bacteria.
- Q.8 How seeds are evolved?
- Q.9 Why mitochondria is called power house of cell?
- Q.10 Why Calvin cycle is also called C_3 cycle?
- Q.11 Differentiate between gram-positive and gram-negative bacteria.
- Q.12 Write an essay on economic importance of fungi?

Section-C
(Descriptive Question)

Note: Answer any 02 question of the following:

- Q.13 Describe the properties and roles of starch, glycogen, cellulose and chitin.
- Q.14 What is enzyme? Explain characteristics of enzyme.
- Q.15 Explain the chemical composition and function of plasma membrane in regulating cell's interactions with environment.
- Q.16 Explain the lytic life cycle of Bacteriophage with labeled diagram.
- Q.17 Describe the classification of enzymes.

Section-A

(Multiple Choice Questions (MCQ's))

Q.1 Choose the correct answer for each from the given options:

- (i) During the drought conditions to reduce the rate of transpiration in plants, the abscisic acid is released from _____
(a) Guard cell (b) Mesophyll cell (c) Root hairs (d) Xylem
- (ii) When ecological succession occurs on dry terrestrial places like rocks, it is called _____.
(a) Xerosere (b) Hydrosere (c) Root hairs (d) Hydrarch
- (iii) Mendel's second law of inheritance can be demonstrated by:
(a) Monohybrid crosses (b) Test cross (c) Dihybrid cross
(d) Both (a) and (b)
- (iv) The nature of endosperm (food storage tissue) is _____.
(a) N (b) $2N$ (c) $3N$ (d) $4N$
- (v) If there are 60 nitrogenous bases on mRNA, how many amino acids could be coded?
(a) 20 (b) 30 (c) 40 (d) 60
- (vi) Vertically sea is divided into _____ zones.
(a) Neritic and oceanic (b) Euphotic and aphotic
(c) Euphotic, bathyal and abyssal (d) Bathyal and abyssal
- (vii) Plasmolysis can occur, when a plant cell is placed in _____ solution.
(a) Hypertonic (b) Hypotonic (c) Isotonic (d) None of these
- (viii) During secondary growth, the part of xylem becomes non-functional for transport, due to some chemical and physical changes this part of xylem is called _____.
(a) Sap-wood (b) Heart wood (c) Lenticel (d) Autumn wood

Section-B (Short Answer)

- Q.2 How and when does the meiotic error take place?
- Q.3 Enlist the types of plant movements that occur in radially symmetrical parts in response to external stimuli. Also write the nature of stimulus against each type.
- Q.4 What is APICAL DOMINANCE? Which hormone maintains it?
- Q.5 Give role of different hormones in plant movement?
- Q.6 Why gymnosperms are called heterosporous? Enlist the cells of their male gametophyte.
- Q.7 How did Hershey and Chase differentiate between DNA and proteins in their experiments, while proving that DNA is hereditary material.
- Q.8 Define any TWO of the following:
(i) Spadix (ii) Nucleosome (iii) Phytochromes
- Q.9 How the environmental conditions of tundra are not favourable for producers and consumers?
- Q.10 Distinguish between any ONE of the following in tabulated form.
(i) Mesophytes and Hydrophytes, (ii) Hydrosere and Xerosere
- Q.11 Why humidity is low at high altitudes and how the rate of transpiration is neutralized there?
- Q.12 How does "Chromosomal theory of heredity" justify Mendel's works? Give any three points.
- Q.13 What are CODONS and ANTI-CODONS. How they work in protein synthesis?
- Q.14 How sex is determined in human being?
- Q.15 Give any TWO events of each G₁ and G₂ phases that occur during interphase of Mitosis?

Section-C (Descriptive Answer)

Q.16 Give the terms for the alteration in genetic material. What are the types of chromosomal aberration?

Q.17 Which type of cell division result equal quantitative and unequal qualitative distribution of chromosomes? Describe with the help of diagram.

Q.18 A man whose father is normal and mother is colour blind marries a carrier woman? What will be the expected phenotype proportion in their children? (Prove it with the help of genetic crosses) Gene for normal = (Gene for colour blind – n)

OR What is UP-WELLING? Describe the marine life in various zones of the sea.

Section-A

(Multiple Choice Questions (MCQ's))

Q.1 Choose the correct answer for each from the given options:

- (i) Photosynthetic bacteria liberate:
(a) CO_2 (b) O_2 (c) S (d) H_2S
- (ii) Viruses carry the RNA strand complementary to the mRNA that carries the genetic information are called:
(a) Enveloped plus strand RNA Viruses
(b) Unenveloped plus strand RNA Viruses
(c) Minus-strand RNA Viruses (d) Small Genome DNA Viruses
- (iii) Fertilization in spermatophytes does not need water because of:
(a) Roots (b) Pollen tubes (c) Styles (d) Stigma
- (iv) The cell membrane of a Bacterial cell often invaginates to produce membranous structures referred to as:
(a) Centrosome (b) Dictyosomes (c) Polysomes (d) Mesosomes
- (v) Chloroplast contains densely packed stacks of the thylakoids known as:
(a) Stroma (b) Grana (c) Frets (d) Matrix
- (vi) The total stem parasite is:
(a) Loranthes (b) Utricularia (c) Viscum (d) Cuscuta
- (vii) Spikelet inflorescence belongs to the family:
(a) Solanaceae (b) Mimosaceae (c) Poaceae (d) Fabaceae
- (viii) Plants in which photorespiration occurs are termed biochemically as:
(a) CMA plants (b) C_4 plants (c) C_3 plants (d) Both (a) and (b)
- (ix) Mosquitoes inject Plasmodium to Human in the form of:
(a) Trophozoites (b) Sporozoites (c) Merozoites (d) Gametocytes

Section-B

(Short Answer)

Note: Answer any TEN of the following questions. Each question carries 02 marks.

- Q.2 What is meant by Taxon?
- Q.3 Write only the names of any FOUR animal, viral diseases with their respective causative agents.
- Q.4 What are the three different pathways available in root for water to enter xylem?
- Q.5 How Predator Fungi obtain their food?
- Q.6 Why do we say that sporophyte of ANTHOCERTOE shows many advanced characters suitable for land?
- Q.7 Why synthesis of ATP during Glycolysis is known as "substrate level phosphorylation"?
- Q.8 Define any TWO of the following:
(i) Binomial Nomenclature (ii) Cones (iii) Plasmid (iv) Fermentation
- Q.9 Distinguish between any ONE of the following:
(i) Zygomycota and Ascomycota (ii) Ascet of sap and Translocation
- Q.10 Why do biologists consider Kingdom Protocista as a poly-phyletic group of organisms?
- Q.11 Write down botanical names of the following:
(i) Peach (ii) Tobacco (iii) Sweet Pea (iv) Siris
- Q.12 Define Lichens. What is the role of the Fungi and Algae in Lichens?
- Q.13 Why carnivorous plants use insects as food?
- Q.14 Why control of bacteria is important? How it can takes place?

Section-C

(Descriptive Answer)

Note: Answer any TWO of the following questions. Each question carries 7 marks.

- Q.15 Describe the structure and reproduction of ULVA with reference to isomorphic alternation of generation.
- Q.16 What are Bryophytes? Describe the life cycle of most advanced type of Bryophyte. Illustrate your answer with reference to alternation of generation.
- Q.17 Define Photosynthesis. Describe the calvin Cycle of Photosynthesis.

Section-A

Multiple Choice Questions (MCQ's)

Q.1: Choose the correct answer for each from the given options:

- (i) Intercalary Meristem may found at:
(a) Below the Node (b) Base of inter-node
(c) At the Cambium Ring (d) Both (a) and (b)
- (ii) In mature cell, chromosome consist of two genetically identical threads called.
(a) Chromatids (b) Chromomers
(c) Homologous Chromosome (d) Chromonema
- (iii) The means of reproduction in Unicellular organisms is:
(a) Spore formatin (b) Cell-division (c) Gametes fromation
(d) Amitosis
- (iv) Parthenocarpy is the type of asexual reproduction:
(a) Found in plants (b) Type of asexual reproduction
(c) Fruit form without fertilization (d) All of these
- (v) The type of chromosomal aberratio where size of chromosome does not change:
(a) Deletion (b) Translocation (c) Inversion (d) Duplication
- (vi) Carbohydrate molecules which formed in cytosol to prevent freezing is:
(a) Glucagon (b) Strach (c) Fruction (d) Dextrins
- (vii) Living tissues of plants have elongated cell with irrgeularly thickened cell wall are:
(a) Collenchyma (b) Sclereides (c) Fiber (d) Tracheids
- (viii) The hydrophytes and Elpiphytes are the producers of:
(a) Coniferous forest (b) Temperate deciduous forest
(c) Tropical rain forest (d) Mangorves forest
- (ix) Cells in the spaces between the fingers that are no longer needed perform:
(a) Growth (b) Necrosis (c) Mitosis (d) Apoptosis

Section-B (Short Answer)

Note: Answer any TEN of the following questions.

- Q.2: What types of plants grow in the soil and air of low water potential and how they adapt there?
- Q.3: How young (Primary) stem get mechanical support?
- Q.4: Which of the plant hormone produced by plants during adverse environmental conditions?
- Q.5: Is there any effect of low temperature on the the promotion of flowering? Name the phenomenon and explain how?
- Q.6: How high and hlow concentration of O₂ effects the growth of plants?
- Q.7: How Histone protein is different from other proteins and why they bind to DNA to form Nucleosome?
- Q.8: Why abnormal Chromosome number appears in an organism? Name the term used for abnormal chromosome number?
- Q.9: Why members of population are variable in length? Give genetical reason and phenomenon.
- Q.10: " Pond is balanced system between water and Nutrient" justify the statement.
- Q.11: Which of the Biome found near Arctic Ocean? Give its three salient features.
- Q.12: Define any TWO of the following:
(a) Co-Dominance (b) Annual Rings (c) Transposition
- Q.13: Distinguish between any one of the following in tabulated form.
(a) Neretic and Oceanic Region (b) Epigeal and Hypogeal Germination
- Q.14: What is role of growth hormone in plant movement?

Section-C (Descriptive Answer)

Note: Answer any TWO of the following questions.

- Q.15: What are Pollen Grains? Where they produced inside flower and develop into male gametophyte?
- Q.16: What do you mean by plant movement? Describe different types of movement takes place due to external stimuli.
- Q.17: A male mouse has a gene of Gray coat colour (B) which is dominant over black colour gene(b). If gene (I) is present in the same mouse which interfere the trait of skin colour as well as dominant over (i) then what will be the chances of phenotypic ratio of children when heterozygous male and female mice for both trait are crossed. Also give the phenotypic ratio of parents, prove it with the help of Genetic cross.

