DEHRADUN PUBLIC SCHOOL
ASSIGNMENT 2022-23
SUBJECT- BIOLOGY (044)
CLASS- XI

Chapter-1: The Living World

Case Based Questions:

Q1. When we try to define 'living', we conventionally look for distinctive characteristics exhibited by living organisms. Growth, reproduction, ability to sense environment and mount a suitable response are unique features of living organisms. Few more features like metabolism, ability to self replicate, self organize and interact can be added to the list.
Read the passage carefully and answer the following questions:

i. Which of the following living phenomenon is absent in viruses ?
   a. Mutation b. Replication
   c. Production of energy d. All of the above

ii. All the chemical energy transformations that occur within a cell is called_____
   a. Growth b. Metabolism
   c. Reproduction d. Response to external stimuli

iii. Metabolism can be defined as_____
   a. Series of chemical reactions to sustain life
   b. Series of mechanical breakdown to sustain life
   c. Study of chemical reactions
   d. Series of binomial nomenclature

iv. An attribute found in plants but not animals is_____
   a. Metabolism b. Sexual reproduction
   c. Autotrophy d. Asexual reproduction

v. The defining characteristics of living organisms include_____
   a. Habitat b. Size of organism
   c. Physiological features d. All of the above

Objective type Questions:

Q2. Which one is an incorrect statement?
a. Botanical gardens have a collection of living plants for reference.
b. Herbarium have dried, pressed and preserved plant specimens.
c. Key is a taxonomic aid for identification of specimen.
d. A museum has collection of photographs of animals and plants.

Q3. The nomenclature is given by whom according to which humans are called *Homo Sapiens*_____
a. Darwin b. Mendel c. Aristotle d. Linnaeus

Q4. The label of herbarium sheet does not carry information on_____
a. Height of the plant b. Date of collection c. Name of collector d. Local name

Q5. Assertion: Systematics is the branch of biology that deals with classification of organisms.
Reason: Aim of classification is to group the organisms in orderly manner.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: Living organisms possess specific individuality with the definite shape and size.
Reason: Both living and non-living entities resemble each other at the lower level of organization.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions:

Q7. Differentiate between obligate categories and intermediate categories.
Q8. Name the various units of classification in their hierarchical levels.
Q9. Why is simpler common name not used instead of the complex scientific name in biology.
Q10. What is the role of botanical gardens in biosystematics studies?
Q11. What is a Herbarium? How is it prepared?

Long Answer Type Questions:

Q12. Name the four processes that are basic to taxonomy.
Q13. Discuss in detail the binomial nomenclature of living organisms given by Carolus Linnaeus.
Q14. Plants and animals grow by mitotic cell divisions. What differences do they exhibit in their growth?
Q15. Why are living organisms classified? What role does it play in research and development?
Q16. How is a 'Key' helpful in classification of an organism?

Chapter-2: Biological Classification

Case Based Questions:

Q1. Virus is a nucleoprotein which is able to utilize the synthetic machinery of a living cell of another organism for its multiplication which does not involve growth and division. Virus is the smallest entity. An inert virus is called virion. It can be crystallized and stored indifferently. Viruses are host specific. They cause diseases in plants as well as in animals.

Read the passage carefully and answer the following questions:

i. A virus can be considered living as it_____.
   a. Reproduces inside the host. b. Can cause diseases
   c. Responds to touch stimuli d. Respires.

ii. Viroids differ from viruses in having_____.
   a. DNA molecules without protein coat. b. RNA molecules with protein coat
   c. RNA molecules without protein coat d. DNA molecules with protein coat

iii. The process in which viruses are involved in sexual reproduction of bacteria is called___.
   a. Transduction b. Transcription
   c. Transformation d. Translation

iv. The virus which has a double stranded RNA as its genetic material_____.
   a. TMV b. Retroviruses
   c. Influenza virus d. Bacteriophage

v. Agent consisting of abnormally folded proteins_____.
   a. Lichens b. Viroids c. Viruses d. Prions

Objective Type Questions:

Q2. Lichens are composite organisms containing an alga and _____.
   a. Fungus b. Bacterium c. Moss d. Protozoan

Q3. Yeast is included in fungi but not in Protista because_____.
   a. It has eukaryotic organisation
   b. Chlorophyll is absent
   c. It forms pseudomycelium
   d. Cell wall has cellulose and food reserve as starch

Q4. Methanogens belongs to_____
   a. Eubacteria b. Archaebacteria
   c. Dinoflagellates d. Slime moulds

Q5. Assertion: Bacteria are classified among plants.
Reason: They have cell walls.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: Anabaena inhabits root nodules of leguminous plant.
Reason: Leguminous plants are an example of symbiotic nitrogen fixation.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions:

Q7. State the difference between 'artificial', 'natural' and 'phylogenetic' systems of classification.
Q8. How is five kingdom classification advantageous over two kingdom classification.
Q9. Why are blue-green algae included under Monera and not under Plantae?
Q10. What are halophiles and thermoacidophiles?
Q11. What are sac fungi? How do they reproduce sexually?

Long Answer Type Questions:

Q12. Why are some fungi grouped under 'fungi imperfecti'?
Q13. Describe the association known as mycorrhiza, and explain how each partner benefits?
Q14. Make a list of fungi that have commercial value as source of food, chemicals and medicines.
Q15. Who proposed the five kingdom classification? Name the five kingdoms.
Q16. Draw a well labeled diagram of bacteriophage.

Chapter-3: Plant Kingdom

Case Based Questions:

Q1. Algae are diverse group of aquatic organisms. They are unicellular or multicellular and undifferentiated organisms that occur in variety of forms and sizes. Algae belong to a polyphyletic group, the organisms of this group are not related to each other. Based on the pigment composition and reserved food material, algae had been divided into three major classes. The members of these classes also differ in cell wall compositions, stored food material, body structure, mode of reproduction etc.

Read the passage carefully and answer the following questions:

i. A representative organisms of class Rhodophyceae is _____.
a. Spirogyra b. Fucus c. Polysiphonia d. Chlorella

ii. Multicellular, saline forms are found in _____.
a. Rhodophyceae b. Chlorophyceae
c. Pheophyceae d. All of the above

iii. Stored food material in class – Phaeophyceae is _____.
a. Mannitol and laminarin b. Floridean starch
c. Pyrenoids d. Starch

iv. Cell wall of *Porphyra* (red algae) contains _____.
a. Cellulose b. Pectin c. Polysulphate esters d. All of these

v. Green algae used by space travellers as protein rich food _____.
a. Chlorella b. Resin
c. Sargassum d. Spirogyra

Objective type Questions:

Q2. Sporophyte is dependent on gametophyte in_____.
a. Bryophytes b. Angiosperms c. Gymnosperms d. Pteridophytes

Q3. Fusion of two motile gametes which are dissimilar in size is termed as _____.
a. Oogamy b. Anisogamy c. Isogamy d. Zoogamy

Q4. Agar-agar is obtained from _____.
a. Gigartina b. Gracillaria c. Gelidium d. All of these

Q5. Assertion: Gametophyte is dominant in diplontic life cycle.
Reason: In diplontic life cycle, free living sporophyte is absent.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: The scales which cover young rhizome and leaves of Dryopteris are called ramenta.
Reason: Pteridium lacks ramenta.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions:

Q7. Mention two common characteristics shared by all gymnosperms.
Q8. What are the advantages of seeds over spores as means of reproduction?
Q9. How do bryophytes differ from pteridophytes?
Q10. Gametophyte is a dominant stage in the life cycle of bryophytes. Explain.
Q11. Why bryophytes are called amphibians of plant kingdom?

Long Answer Type Questions:

Q12. In which group of plants will you look for mycorrhiza and coralloid roots? Explain what does these terms mean.
Q13. Give an account of sexual reproduction and economic importance of Pteridophytes.
Q14. Both gymnosperms and angiosperms bear seeds, but why are they classified separately?
Q15. Why is the plant body (dominant phase) of bryophytes called gametophyte?
Q16. Name one dioecious liverwort. How liverworts differ from mosses?

Chapter -4: Animal Kingdom

Case Based Questions:

Q1. Your younger brother is fascinated by the fact that animals are found in the marine ecosystem. You take him to Aquarium House in your city, there he sees many aquatic animals and also watch documentary on their increasing death rates due to human activities.
Read the passage carefully and answer the following questions:

i. In Class Pisces we have two classes of fishes. Choose the correct class of above fish____.
a. Osteichthyes b. Chondrichthyes
c. Both a & b d. None

ii. One characteristic feature of Pisces_____.
a. Have fins b. Have scales on their body
c. Cold blooded with water domain d. All of the above

iii. Star fish is a member of_____.
a. Pisces b. Echinodermata
c. Annelida d. Helminthes

iv. How can we help in maintaining the aquatic animal diversity?
a. Throwing less plastic in seas b. Mixing of wastes in river, seas etc
c. Creating awareness among people d. All of the above.

v. The cartilaginous fish includes all except _____.
a. Lampreys b. Sharks c. Skates d. Rays

Objective Type Questions:

Q2. Which one of the following sets of animals share a four chambered heart?
a. Amphibian, Reptiles, Birds b. Crocodiles, Birds, Mammals
c. Crocodiles, Lizards, Turtles d. Lizards, Mammals, Birds

Q3. The excretory structures of flatworms/Taenia are _____.
a. Flame cell b. Protonephridia
c. Malpighian tubules d. Green glands.

Q4. A chordate character is _____.
a. Gills b. Spiracles
c. Post-anal tail d. Chitinous exoskeleton.

Q5. Assertion: Skin is moist in birds.
Reason: This reduces effects of friction due to flying in air
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: The body of hemichordates is divisible into proboscis, collar and trunk
Reason: Proboscis gland helps in digestion.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions:

Q7. Give an outline classification of kingdom Animalia.

Q8. What are the possible advantages and disadvantages of chitinous exoskeleton in arthropods?

Q9. Give three structural differences between a frog and a lizard.

Q10. Why are all sponges, regardless of size, limited to feeding on microscopic food particles?

Q11. What is pseudocoelom? What are the advantages of having a coelom?

Long Answer Type Questions:

Q12. Endoparasites are found inside the host body. Mention the special structures possessed by these and which enables them to survive in those conditions.

Q13. What four characteristics do all chordates have at some time in their life time?

Q14. Classify phylum Chordata upto classes giving some important characters and examples of each group.

Q15. Draw a labeled diagram of the basic body plan of the chordates.

Q16. Compare the water transport system of Poriferans and the Echinoderms.

Chapter-5: Morphology Of Flowering Plants

Case Based Question:

Q1. The flower is the reproductive unit in the angiosperms. It is meant for sexual reproduction. A typical flower has four different kinds of whorls arranged successively on the swollen end of the stalk or pedicel, called thalamus or receptacle. These are calyx, corolla, androecium and gynoecium.

Read the passage carefully and answer the following questions:

i. In symmetry, the flowers may be actinomorphic which means _____.
   a. Bilateral symmetry b. Radial symmetry
   c. Asymmetric d. Diagonal symmetry.

ii. Tetramerous flower means having_____floral appendages.
   a. 2 b. 4 c. 5 d. 3

iii. In hypogynous flower the gynoecium occupies the_____.
   a. Highest position b. Centre c. Inferior d. None of these.

iv. Which of the flowing is not the part of a gynoecium flower?
   a. Calyx b. Corolla c. Pedicel d. Filament

v. _____ are the non-essential part of a flower.
   a. Androeciom and Gynoecium b. Sepals and Carpels
   c. Sepals and Petals d. Sepals and Gynoecium

Objective Type Questions:

Q2. The largest petal overlaps the lateral ones in_____aestivation.
a. Papilionaceous b. Valvate
c. Twisted d. Imbricate

Q3. The coloured part of a Bougainvillea flower is the _____.
a. corolla b. calyx
c. bracts d. androecium

Q4. The arrangement of sepals or petals in floral bud is called_____.
a. Placentation b. Aestivation c. Bracteate d. Phyllotaxy

Q5. Assertion: The cymose type of inflorescence has limited growth.
Reason: In cymose in florescence the main axis terminates in a flower.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: Flower of racemose inflorescence are pollinated by insects.
Reason: In Racemose head inflorescence, the florets are arranged in a centripetal fashion.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions:

Q7. How would you distinguish a dicot leaf from a monocot leaf by external observations only?

Q8. Give any two morphological differences between potato tuber and tuberous roots of Dahlia.

Q9. How would you prove that potato tuber is a stem and not a root?

Q10. Draw the various types of aestivation possible for a typical pentamerous flower.

Q11. Describe the structure of a maize grain.

Long Answer Type Questions:

Q12. Justify the following statements on the basis of external features:-
i. Underground parts of a plant are not always roots.
ii. Flower is a modified shoot.

Q13. What is a parthenocarpic fruit? Give two examples. Explain how true fruits differ from false fruits?

Q14. What are stilt roots? Give two examples.

Q15. How is the pinnately compound leaf different from a palmately compound leaf? Explain with the help of a well labeled diagram.

Q16. Differentiate between apocarpous ovary and syncarpous ovary. How will you differentiate between a superior and inferior ovary?

Chapter-6: Anatomy Of flowering plants

Case Based Question:

Q1. A tissue system usually consists of only one tissue or an association of tissues which performs the same function. The Vascular tissue system consists of a variable number of vascular bundles which are arranged in a ring in roots and dicotyledonous stems but are scattered in general ground tissue in monocotyledonous stems. The vascular systems conducts water and raw food materials from roots to leaves and prepared food materials from leaves to storage organs and growing regions.
Read the passage carefully and answer the following questions:

i. Vascular bundles are scattered in _____.
a. Monocot root b. Dicot stem
c. Dicot root d. Monocot stem

ii. The presence of cambium is characteristic feature of_____.
a. Monocots b. Dicots c. Both 'a' and 'b' d. None of the above

iii. Identify the tissue system from the following_____.
a. Parenchyma b. Lacteals c. Epidermal d. Endarch

iv. Conjoint and open vascular bundles are found in _____.
a. Roots b. Maize stem c. Cucurbits root d. Mango stem

v. The presence of casparian strips is characteristic feature of_____.
a. Monocot root b. Dicot stem c. Dicot root d. Monocot stem

Objective Type Questions:

Q2. Meristematic activity is seen maximum in_____.
a. Shoot b. Leaf c. Bud d. Root hair

Q3. Companion cells are seen associated with _____.
a. Secondary cambium b. Idioblasts c. Tracheids d. Seive tubes

Q4. Vascular tissue that conducts organic solute_____.
a. Xylem b. Trichome c. Phloem d. Mesophyll

Q5. Assertion : Open vascular bundles are found in dicot stem & gymnosperm.
Reason : Cambium is absent in between xylem & phloem.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: Each stoma is composed of two bean shaped cells known as guard cells.
Reason: Guard cells regulate the opening and closing of stomata.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions-

Q7. Name the dead tissue present in a 20 year old Neem tree.
Q8. Name the components of Epidermal tissue system.
Q9. What are Trichomes? Mention the function perform.
Q10. Define exarch and endarch conditions of vascular bundles.
Q11. Define the function of cortex.

Long Answer Type Questions-

Q12. With the help of suitable examples describe the various types of vascular bundles in plants.
Q13. Explain the structure of stomata with the help of diagram.
Q14. Explain the components of Vascular Tissue System.
Q15. General cortex and Pith constitute major part of the ground tissue system. Explain
Q16. Explain the types of vascular bundles on the basis of the position of protoxylem in plants.

Chapter-7: Structural Organizations In Animal

Case Based Questions:

Q1. Frogs can live both on land and in freshwater and belong to class Amphibia of phylum Chordata. They do not have constant body temperature i.e., their body temperature varies with the temperature of the environment. They have the ability to change the colour to hide them from the enemies. The skin is smooth and slippery due to the presence of mucus. Frogs are not seen during peak summer and winter.

Read the passage carefully and answer the following questions:

i. Common species of frog found in India_____.
a. *Rana tigrina* b. *Rana temporaria* c. *Lithobates catesbeianus* d. *Bufonidae*

ii. Membranous structure found on either side of eyes of frog is_____.
a. Labryinth b. Tympanum
c. Pharynx d. Nostrils

iii. Partially digested food in frog is _____.
a. Papillae b. Crop
c. Bolus d. Chyme

iv. Ureotelic animals excrete_____.
a. Uric acid b. Urea c. Ammonia d. All of these

v. Male frogs can be distinguished from female frogs by _____.
a. Vocal sacs b. Copulatory pads c. Both a and b d. None of these

Objective type Questions:

Q2. Vocal sacs are found in _____.

a. Male frogs b. Female frogs c. Both 'a' and 'b' d. None of these

Q3. Taking shelter in deep burrows during peak summers is _____.

a. Camouflage b. Aestivation

c. Hibernation d. None of the above

Q4. The organisms that excrete urea_____.

a. Uricotelic b. Ammonotelic c. Ureotelic d. Nephron

Q5. Assertion: Columnar epithelium lining the intestinal mucosa appears to have a brush like appearance.

Reason: A large number of microvilli are present in frog.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.

d. If Assertion is false but Reason is true.

Q6. Assertion: Specialization of cells is advantageous for the organisms.

Reason: It increases the operational efficiency through division of labour which avoids duplication of work.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.

d. If Assertion is false but Reason is true.

Short Answer Type Questions:

Q7. How can you differentiate between a male and a female frog?

Q8. Define cutaneous respiration in frogs.

Q9. How the elimination of excretory products takes place in frogs?

Q10. Name the sense organs in frog. What is the function of ear in frogs besides hearing?

Q11. Frogs are beneficial to mankind, justify.

Long Answer Type Questions:

Q12. Explain the morphology of frog with the help of diagram.

Q13. Describe the blood vascular system of frog.

Q14. Frogs have well developed male and female reproductive systems. Explain with the help of diagrams.

Q15. How food is digested in the alimentary canal of frogs?

Q16. Explain how control and coordination is carried out in frogs?

Chapter-8: Cell – The Unit of Life

Case Based Questions:

Q1. Camillo Golgi (1898) first observed densely stained reticular structures near the nucleus. The Golgi apparatus was first described by Camillo Golgi. Golgi apparatus consists of a set of membrane-bounded, fluid-filled vesicles, vacuoles and flattened cisternae. The cisternae consist of many flat, disc-shaped sacs of 0.5µm to 1.0µm diameter.

Read the passage carefully and answer the following questions:

i. The Golgi cisternae are concentrically arranged near the_____.

a. Periphery b. Vacuole

c. Plastids d. Nucleus

ii. Golgi apparatus is the important site of formation of_____.

a. Glycoproteins b. Glycolipids

c. Phospholipids d. Both a and b.

iii. In Golgi apparatus,_____are stacked parallel to each other.

a. Thylakoids b. Cisternae c. Grana d. Cristae

iv. The plant cells contain many freely distributed subunits of Golgi apparatus, called
a. Dictyosomes b. Stroma
c. Thylakoid d. Granum
v. The golgi apparatus is an important site for the formation of _____.
a. Glycoproteins b. Lipids and starch
c. Lipids and glycoproteins d. Glycoproteins and glycolipids

Objective Types Questions:

Q2. The stacks of closely packed thylakoids is called_____
a. Lumen b. Matrix c. Stroma d. Granum

Q3. The structure of plasma membrane through fluid mosaic model is proposed by_____
a. Gram b. Singer and Nicolson
c. Schwann and Schleiden d. Robert Hooke

Q4. Factory of ribosome in a cell is_____
a. Endoplasmic reticulum b. Nucleolus c. Mitochondria d. Golgi body

Q5. Assertion : Centrosomes and centrioles are related to each other.
Reason : Centrosome usually contains two cylindrical structures called centrioles.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: The arrangement of axonemal microtubules in cilia or flagella is called 9 + 2 array.
Reason: The axoneme usually has nine pairs or doublets of radially arranged peripheral microtubules, and pair of centrally located microtubules.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions:

Q7. What are two principle roles of the nucleus?
Q8. What is mesosome in a prokaryotic cell? Mention the functions that it performs.
Q9. Name the different types of plastids that may be found in plant cells.
Q10. List the functions of smooth and rough endoplasmic reticulum.
Q11. Name two double membrane bound cell organelle. Draw the structure of any one of them.

Long Answer Type Questions:

Q12. Why are membranes described as proteins in a sea of lipids? Explain with an example.
Q13. Name any two single membrane bound cell organelles. How these can be differentiated from each other?
Q14. Give an account of the structure and functions of various components of nucleus.
Q15. Describe the structure of chloroplast with the help of diagram.
Q16. What structural and functional characteristics do cilia, flagella and centrioles have in common?

Chapter-9: Biomolecules

Case Based Questions:

Q1. When a protein in its native form, is subjected to physical changes like change in temperature or chemical changes like change in pH, the hydrogen bonds are disturbed. Due to this, globules unfold and helix get uncoiled and protein loses its biological activity. This is called denaturation of protein. The denaturation causes change in secondary and tertiary structures but primary structures remains intact. Examples of denaturation of protein are coagulation of egg white on boiling, curding of milk, formation of cheese when an acid is added to milk.

Read the passage carefully and answer the following questions:

i. Mark the wrong statement about denaturation of proteins.

a. The primary structure of the protein does not change.
b. Globular proteins are converted into fibrous proteins.
c. Fibrous proteins are converted into globular proteins.
d. The biological activity of the protein is destroyed.

ii. Which statement(s) of protein remain(s) intact during denaturation process?
a. Both secondary and tertiary structures b. Primary structure only
c. Secondary structure only d. Tertiary structure

iii. Which of the following will not denature a protein?
a. Temperature above100^{o}C b. Strong acids or strong bases
c. Alcohol d. Distilled water

iv. α-helix and β-pleated structures of proteins are classified as _____.
a. Primary structure b. Secondary structure
c. Tertiary structure d. Quaternary structure

v. Secondary structure of protein refers to_____
a. Mainly denatured proteins and structures of prosthetic groups.
b. Three-dimensional structure, especially the bond between amino acid residues that are distant from each other in the polypeptide chain.
c. Linear sequence of amino acid residues in the polypeptide chain.
d. Regular folding patterns of continuous portions of the polypeptide chain.

Objective type Questions:

Q2. Which one of the following pairs of nitrogenous bases of nucleic acids is wrongly matched with the category mentioned against it?
a. Adenine, Thymine – Purines b. Uracil, Cytosine – Pyrimidines
c. Guanine, Adenine – Purines d. Thymine, Uracil – Pyrimidines

Q3. Proteins perform many physiological functions. For example, some function as enzymes. Which one of the following represents an additional function which some proteins discharge?
a. Antibiotics b. Pigments making colours of flowers
c. Hormones d. Pigments conferring colour to skin

Q4. An enzyme/protein is formed by chemically bonding together _____.
a.CO_2 b. Lipases c. Carbohydrates d. Amino acids

Q5. Assertion : Glycosidic bonds are formed by dehydration.
Reason : In polysaccharides, individual monosaccharide is linked by glycosidic bond.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion : Glycosidic bonds are formed by dehydration.
Reason : In polysaccharides, individual monosaccharide is linked by glycosidic bond.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short Answer Type Questions:

Q7. Are enzymes specific for only specific compounds? Explain.
Q8. What is meant by tertiary structure of proteins?
Q9. What are polysaccharides? Give two examples.
Q10. Can you describe what happens when milk is converted into curd/yogurt?
Q11. How are prosthetic groups differ from co-factors?

Long Answer Type Questions:

Q12. What are the factors which influence enzyme activity?

Q13. Describe feedback inhibition of a metabolic pathway.

Q14. Describe the mode of enzyme action.

Q15. Describe the important properties of enzymes.

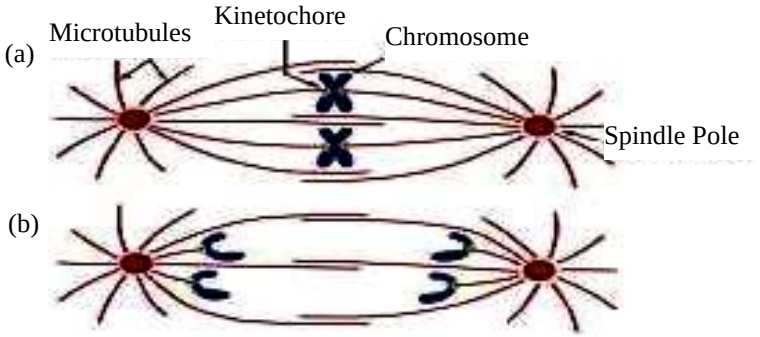
Q16. Define the following terms:

a. Glycosidic bond
b. Competitive Inhibitor
c. Apoenzymes
d. Activation energy

Chapter- 10: Cell Cycle and Cell Division

Case based questions:

Q1. Study the given figure and answer the following questions:



i. Identify the stages of labelled figures a and b.

a. Metaphase and Metaphase I
b. Metaphase and Anaphase
c. Metaphase II and Anaphase I
d. Anaphase I and Anaphase II

ii. Which stage shows spindle formation?

a. Telophase
b. Metaphase
c. Both of these
d. None of these

iii. Which of the following occur in anaphase but not in anaphase-I?

a. Condensation of chromosomes
b. Poleward movement of chromosomes
c. Contraction of spindle fibres
d. Splitting of centromere.

iv. Meiotic stage in which the homologous chromosomes separate while the sister chromatids remain associated at their centromeres.

a. Metaphase-I
b. Diplotene
c. Diakinesis
d. Anaphase

v. Name the stage that begins with the simultaneous splitting of centromere of each chromosome.

a. Prophase
b. Metaphase
c. Anaphase
d. Telophase

Objective type Questions:

Q2. In the somatic cell cycle-

a. DNA content in G1 phase is double the amount of DNA content in the original cell
b. DNA replication takes place in S phase
c. A short interphase is followed by a long mitotic phase
d. G2 phase follows mitotic phase.

Q3. At which stage of the cell cycle, histone proteins are synthesised in a eukaryotic cell?

a. During Go phase
b. During S-phase
c. During entire prophase
d. During telophase

Q4. Mitosis is the process by which eukaryotic cells_____.

a. grow
b. expose genes for protein synthesis
c. become specialised in structure and function
d. multiply

Q5. Assertion : Sexual reproduction always needs meiosis.
Reason : Gametes involved in sexual reproduction are always haploid.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion : Mitosis occurs in both unicellular and multicellular organisms.
Reason : Mitosis is a method of sexual reproduction in unicellular organisms.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short type questions-

Q7. A cell having 32 chromosomes, undergoes mitotic divisions. What will be the chromosome number (*n*) during metaphase? What would be the DNA content during anaphase?

Q8. Why do the chromosomes become short and thick in prophase?

Q9. Give a specific scientific term for each of the following:
i. The period between meiosis I and meiosis II.
ii. Point at which two sister chromatids are held together.
iii. Phase in the cell cycle when protein and RNA are synthesised.
iv. Mitotic poison that does not allow the formation of spindle.

Q10. Why is mitosis called equational division?

Q11. There occurs a process in which division of nucleus takes place. Identify the process and also write about its different phases.

Long Answer type questions-

Q12. Briefly describe the significance of cell division.

Q13. Explain why a pair of homologous chromosomes are genetically different, but a pair of sister chromatids are genetically identical before crossing over in meiosis.

Q14. Describe the following terms:
i. Synapsis ii. Bivalent iii. Chiasmata

Q15. Distinguish between anaphase of mitosis from anaphase-I of meiosis.

Q16. Analyse the events during every stage of cell cycle and briefly explain in relation with chromosome number and DNA content.

Chapter13: Photosynthesis in Higher Plants

Case-Based Questions:

Q1. Succulents like *Bryophyllum, Kalanchoe, Sedum,* etc., are xerophytes and grow under semi arid conditions. In such plants, stomata are closed during the day to conserve the water that would be lost under dry conditions. Stomata open at night and the atmospheric carbon dioxide is fixed into organic acids like malic acid, oxaloacetic acid, etc. This process of conversion of carbon dioxide into organic acid is called acidification. This carbon dioxide fixed during the night is released during the day by the process of deacidification and is used for photosynthesis. Land plants on the other hand, take carbon dioxide from the atmosphere in the gaseous form which is utilized for photosynthesis. This carbon dioxide enters through stomata. However, when these land plants are submerged in water, plants close their stomata and hence, entry of carbon dioxide is also stopped. In such plants therefore, photosynthesis cannot occur in submerged land plants.

Read the passage carefully and answer the following questions:

i. Pick out the plant that does not grow in arid condition-
a. Cactus b. *Bryophyllum*
c. Sugarcane d. Calyinum

ii. Succulents have their stomata closed during day. This helps in_____.
a. Preventing transportation b. Fixing atmospheric carbon dioxide
c. Conserving water d. Light reaction
i. a and b ii. a and c iii. b and c iv. b and d

iii. The carbon dioxide that is fixed at night is released during the day by the process of_____.
a. Acidification b. Deacidification
c. Carboxylation d. Decarboxylation

iv. Can photosynthesis occur in land plants which are totally submerged in water?
a. Yes b. Maybe c. No d. Sometimes

v. Oxygen is not produced during photosynthesis by_____.
a. *Cycas* b. *Nostoc* c. *Chara* d. Green sulfur bacteria

Objective type Questions:

Q2. In the Hatch and slack pathway the primary carbon dioxide acceptor is_____.
a. Oxaloacetic acid b. Phosphoglyceric acid
c. PEP d. Rubisco

Q3. Which light range is most effective in photosynthesis?
a. Blue b. Green c. Red d. Violet

Q4. Energy required for ATP synthesis in PS II comes from-
a. proton gradient b. electron gradient
c. reduction of glucose d. oxidation of glucose

Q5. Assertion: Photosynthetically C_4 plants are less efficient than C3 plants.
Reason: The operation of C_4 pathway requires involvement of only bundle sheath cells.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: Submerged plants get carbon dioxide in the form of carbonates and bicarbonates.
Reason: Stomata are not present in submerged plants.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short answer type questions:

Q7. By looking at a plant externally, can you tell whether a plant is C3 or C4? How?

Q8. Give a comparison between the leaf in C3 and C4 plants.

Q9. How do photosynthetic bacteria such as cyanobacteria conduct photosynthesis in the absence of chloroplast?

Q10. Mention the conditions when only cyclic photophosphorylation occurs.

Q11. Why is proton gradient important in photosynthesis?

Long answer type questions:

Q12. Photosynthesis refers to a set of chemicals reactions in which energy from the sun changes carbon dioxide and water into glucose and oxygen. Photosynthesis may be the most important chemical reaction on the planet because it releases oxygen and traps carbon. Plants use glucose as a building block to build starch for long-term energy storage and cellulose to build structures.

i. Glucose is a simple sugar, yet it is a large molecule compared to carbon dioxide or water. How many molecules of carbon dioxide and water are needed to produce one molecule of glucose?

ii. Sunlight is most often harnessed by chlorophyll, which is green. Do the plants with red or purple coloured leaves can do photosynthesis? Explain how?

iii. Do the sun is only source of energy for photosynthesis? Justify.

Q13. Describe the structure of the chloroplasts.

Q14. Chlorophyll a is the primary pigment for light reaction. Write down the accessory pigments. Explain their role in the photosynthesis.

Q15. Discuss the behavior of enzyme Rubisco under high oxygen concentration and in the presence of light and C_3 plants.

Q16. Explain:
i. Chloroplasts are generally located at the outer margins of mesophyll cells.
ii. Photorespiration is considered as wasteful process.

Chapter-14: Respiration in Plants

Case-Based Questions:

Q1. Fermentation is a form of anaerobic respiration that is carried out by some microorganisms. It is different from anaerobic respiration because it may occur outside the living cells also. Earlier, fermentation was considered as a strictly chemical process. The fact that it is directly associated with living organisms, was established by Pasteur in 1870. Pasteur also observed that rate of fermentation is higher under anaerobic conditions than aerobic conditions.
The inhibition of anaerobic breakdown of sugar into carbon dioxide and ethyl alcohol, due to presence of oxygen is called Pasteur effect. This effect was further confirmed by Meyerhof and Warburg.
Read the passage carefully and answer the following questions:

i. Choose the correct sentence.
   a. Fermentation is anaerobic respiration.
   b. Fermentation is the aerobic respiration.
   c. Fermentation is a form of anaerobic respiration.
   d. Fermentation is a form of aerobic respiration.

ii. Name the scientist who established that fermentation was associated with living organisms.
   a. Meyerhof. b. Pasteur.
   c. Fleming. d. Warburg.

iii. Pasteur effect is_____.
   a. Inhibition of anaerobic breakdown of sugar due to presence of oxygen.
   b. Increasing rate of anaerobic breakdown of sugar due to presence of oxygen.
   c. Decrease in rate of anaerobic breakdown due to presence of oxygen.
   d. Increase in rate of anaerobic breakdown due to presence of oxygen.

iv. The correct equation for fermentation is_____.
   a. $2C_2H_5OH + 2CO_2$ ------>$C_6H_{12}O_6$
   b. $2C_2H_2O_4 + O2$ ------> $4CO_2 + 2H_2O$
   c. $C_6H_{12}O_6$------>$2C_2H_5OH + 2CO_2$
   d. $C_6H_{12}O_6 + 6CO_2$------> $6CO_2 + 6H_2O$

v. Where fermentation process takes place in the cell?
   a. Mitochondria b. Ribosomes
   c. Cytoplasm d. Vacuole

Objective type Questions:

Q2. The ultimate electron acceptor of respiration in aerobic organism is_____.
   a. Cytochrome b. Oxygen
   c. Hydrogen d. Glucose

Q3. Electron transport systems located in mitochondrial_____.
   a. outer membrane b. inner membrane space
   c. inner membrane d. matrix

Q4. Which of the following exhibits the highest rate of respiration?
   a. Growing shoot apex b. Germinating seed
   c. Root tip d. Leaf bud

Q5. Assertion: Kreb's cycle is amphibolic.
Reason: It involves both anabolism and catabolism.
   a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
   b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
   c. If Assertion is true but Reason is false.
   d. If Assertion is false but Reason is true.

Q6. Assertion: Anaerobic respiration causes fatigue in humans.
Reason: With the rest, the fatigue disappear.
   a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short answer type questions:

Q7. Differentiate between aerobic respiration and fermentation.
Q8. State why the respiratory pathway is referred to as an amphibolic pathway?
Q9. Draw a well labelled diagram of TCA Cycle showing all the steps.
Q10. Oxygen is critical for aerobic respiration. Explain its role with respect to ETS.
Q11. How is proton gradient established?

Long answer type questions:

Q12. Give the systematic representation of glycolysis. State where it occurs and also write the name of its end products.
Q13. Describe the mechanism of electron transport system.
Q14. Give the diagram showing the summary of cell respiration involving the use of carbohydrates, fats and proteins as respiratory substrates.
Q15. Explain the major steps of the Kreb's cycle. Mention the site of Kreb's cycle where it occur in the cell?
Q16. Summarize the chemiosmotic theory of ATP synthesis with the help of well labeled diagram.

Chapter-15: Plant Growth And Development

Case-Based Questions:

Q1. A friend presented Geeta with a bouquet of lovely yellow roses. Geeta put them in a vase with water but was worried that they would die after a few days. She wanted to prolong the vase life of these beautiful flowers. Her teacher advised her to add a little quantity of cytokinin to the water. Geeta added the chemical available and then read about cytokinin. She found out that it was discovered by Miller and Skoog and has many functions like promotion of cell division cell, cell enlargement, morphogenesis, counter action of apical dominance, delay of senescence, accumulation and translocation of solutes.

Read the passage carefully and answer the following questions:

i. Cytokinin is
   a. fertilizer
   b. growth regulator
   c. plant growth hormone
   d. enzyme promoting growth
ii. How did addition of cytokinin help Geeta?
   a. it kept flower fresh for a longer time.
   b. it did not let the scent of roses diminish.
   c. it prevented rotting of stems.
   d. it prevent rotting of leaves.
iii. Which of the following is not true?
   a. Cytokinin helps in cell enlargement.
   b. Cytokinin helps in delaying senescence.
   c. It helps in growth of apical buds.
   d. It promotes cell division.
iv. Cytokinin was post discovered in_____.
   a. Wheat
   b. Maize
   c. Corn
   d. Rice
v. Cytokines are_____.
   a. Adenine derivatives
   b. Guanine derivatives
   c. Cytidine derivatives
   d. Thymine derivative

Objective Type Questions:

Q2. Elasticity in plant growth means that _____.
   a. Plants roots are extensible
   b. Plant growth is dependent on the environment
   c. Stems can extend

d. Roots can extend

Q3. The plant hormone used to destroy weeds in a field is _____.
a. 2, 4D b. IBA c. IAA d. NAA

Q4. Who coined the term 'kinetin'?
a. Skoog and Miller b. Darwin
c. Went d. Kurosawa

Q5. Assertion: Plant have hormones called phytohormones.
Reason: They increase the rate of reaction and thus accelerate growth and other related changes.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: All non- meristematic cells face senescence.
Reason: Meristems are potentially immortal.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short answer type questions:

Q7. Why is abscisic acid also known as stress hormone?

Q8. The role of ethylene and abscisic acid is both positive and negative. Justify.

Q9. Define plant growth hormones. How do they differ from growth regulators?

Q10. *Nicotina tabacum* a short day plant fails to flower, when exposed to more than the critical period of light. Explain.

Q11. Would you expect soybean plans to flower if given a daily light exposure of 15 hours? Give reason.

Long answer type questions:

Q12. Explain different phases of growth with the help of a diagram.

Q13. Describe the conditions necessary for growth.

Q14. Explain:
i. Exogenous application of auxin fails to enhance growth in intact plant.
ii. Vitamins are not plant growth hormones.
iii. Gibberellins do not enhance the growth of isolated plant parts.

Q15. Why is not any one parameter good enough to demonstrate growth throughout the life of a flowering plants?

Q16. Write a short note on growth regulators in plants.

Chapter-17: Breathing and Exchange Of Gases

Case-Based Questions:

Q1. Haemoglobin is a red colored iron containing pigment present in the RBCs. Oxygen can bind with haemoglobin in a reversible manner to form oxyhaemoglobin. Each haemoglobin molecule can carry a maximum of 4 molecules of oxygen. Binding of oxygen with haemoglobin is primarily related to partial pressure of oxygen. Partial pressure of carbon dioxide, hydrogen iron concentration and temperature are the other factors which can interfere with this binding. A sigmoid curve is obtained when percentage saturation of haemoglobin with oxygen is plotted against pO2.This curve is called the oxygen dissociation curve and is highly useful in studying the effect of factors like pCO2, hydrogen ion concentration, etc. on binding of oxygen with hemoglobin.
Read the passage carefully and answer the following questions:
i. _____ of O_2 and Co_2 is carried in a dissolved state through the blood plasma.
a. 3% and 8% b. 70% and 20%
c. 3% and 9% d. 3% and 7%

ii. Oxyhaemoglobin dissociates into oxygen and deoxyhaemoglobin at _____.
a. low oxygen pressure in tissue.
b. high oxygen pressure in tissue.
c. equal oxygen pressure inside and outside tissue.
d. all times irrespective of oxygen pressure.

iii. The oxygen hemoglobin dissociation curve will show right shift in case of _____.
a. high pCO_2. b. high PO_2.
c. low pCO_2. d. less H^+ concentration.

iv. The urge to inhale in human being is _____.
a. rising pCO2. b. rising pO2.
c.falling pCO2. d. falling pO2.

v. Identify the wrong statement with reference to transport of oxygen.
a. binding of oxygen with hemoglobin is mainly related to partial pressure of oxygen.
b. partial pressure of carbon dioxide can interfere with oxygen binding with hemoglobin.
c. higher H^+ concentration in alveoli favors the formation of oxyhemoglobin.
d. low partial pressure carbon dioxide in alveoli favors the formation of oxyhemoglobin.

Objective type Questions:

Q2. Which of the following is an occupational respiratory disorder?
a. Anthrax b. Silicosis
c. Botulism d. Emphysema

Q3. Lungs are made up of air filled sacs, the alveoli. They do not collapse even after forceful expiration because of _____.
a. expiration reserve volume b. inspiratory reserve volume
c. residual volume d. tidal volume

Q4. The partial pressure of oxygen in the alveoli of the lungs is _____.
a. equal to that in the blood b. more than that in the blood
c. less than that in the blood d. less than that of carbon dioxide

Q5. Assertion: Mammals have developed a complex respiratory system.
Reason: Mammalian skin is impermeable to gases.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: Extra oxygen consumption in human body is called oxygen debt.
Reason: The extra oxygen is required by the body to oxidise the accumulated lactic acid produced during strenuous exercise.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short answer type questions:

Q7. Write the various modes of transportation of carbon dioxide in the blood.
Q8. Define Oxygen dissociation Curve. Can you suggest any reason for its sigmoidal pattern?
Q9. Differentiate between vital lung capacity and total lung capacity.
Q10. With the help of arrow marks show the sequence of airflow up to lungs.
Q11. How does adult hemoglobin and foetal hemoglobin different from each other?

Long answer type questions:

Q12. Explain the transport of O_2 and CO_2 between alveoli and tissue with diagram.
Q13. For completion of respiration process, write the given steps in sequential manner
i. Diffusion of gases (O_2 and CO_2) across alveolar membrane.
ii. Transport of gases by blood.

iii. Utilisation of O_2 by the cells for catabolic reactions and resultant release of CO_2.
iv. Pulmonary ventilation by which atmospheric air is drawn in and CO_2 rich alveolar air is released out.
v. Diffusion of O_2 and CO_2 between blood and tissues.

Q14. Explain the location, structure and functions of lungs.

Q15. How do receptors associated with aortic arch and carotid artery regulate respiration?

Q16. Write one symptom of each of the following:
i. Asthma ii. Pneumonia iii. Emphysema iv. Hypoxia

Chapter-18: Body Fluids And Circulation

Case-Based Questions:

Q1. Blood of human beings differ in certain aspects. Various types of grouping of blood has been done. The ABO and Rh- are widely used all over the world.ABO grouping is based on the presence or absence of two surface antigens on the RBCs namely A and B. Similarly the plasma of different individuals contain two natural antibodies. The distribution of antigens and antibodies in the four groups of blood A, B, AB and O are given in the table.
Read the passage carefully and answer the following questions:

i. _____ indicates presence of both antigen A and antigen B on RBCs.
a. Blood Group A. b. Blood Group AB.
c. Blood Group B. d. Blood Group O.

ii. Person with 'AB' blood group are called as "universal recipient". This is due to _____.
a. Presence of antibody, anti-A and anti-B, on RBCs.
b. Absence of antibody, anti-A and anti-B, in plasma.
c. Absence of antigens A and B on the surface of RBCs.
d. Absence of antigens A and B in plasma.

iii. In a certain road accident patient with an unknown blood group needs immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor?
a. Blood Group AB. b. Blood Group O.
c. Blood Group A. d. Blood Group B.

iv. Which one of the following blood cells is involved in antibody production?
a. B-Lymphocytes. b. T- Lymphocytes.
c. RBC d. Neutrophils.

v. Which blood group is "Universal Donor"?
a. Blood Group A. b. Blood Group B.
c. Blood Group O. d. Blood Group AB.

Objective type Questions:

Q2. Bundle of His is a network of_____.
a. no fibers distributed in ventricles.
b. no fibers found throughout the heart.
c. muscle fibers found only in the ventricle wall.
d. muscle fibers distributed throughout the heart walls.

Q3. A human RBC is placed in 1.5% salt solution. It will
a. swell up. b. shrink.
c. humane unaffected. d. burst.

Q4. Mark among the following a cell which does not exhibit phagocytosis activity.
a. Monocytes b. Neutrophil
c. Basophil d. Macrophage

Q5. Assertion: The cardiac output of an ordinary man and of an athlete is the same.
Reason: It is impossible to alter the stroke volume as well as heart rate.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.

d. If Assertion is false but Reason is true.

Q6. Assertion: Blood group 'O' have anti- A and anti- B antibodies.
Reason: It does not have any antigen.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short answer type questions:

Q7. Differentiate between P-wave and T-wave.
Q8. Enumerate the importance of blood in human body.
Q9. Draw a standard ECG and explain the different segments in it.
Q10. Define the Rh- incompatibility in humans.
Q11. Why are RBCs enucleated? Give two reasons.

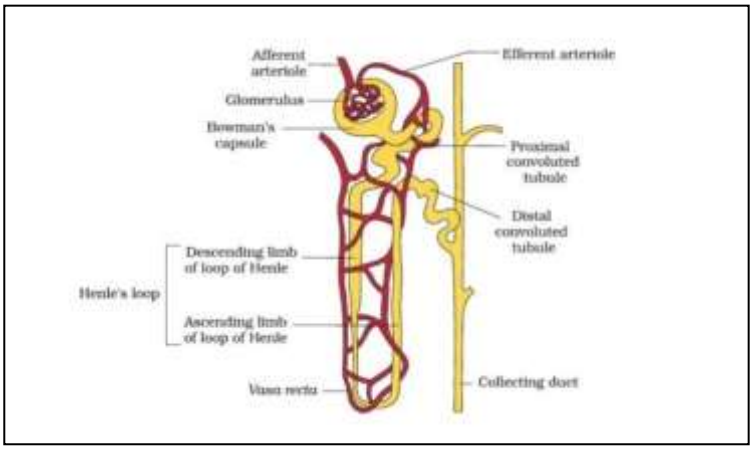
Long answer type questions:

Q12. Describe the stepwise process of coagulation of blood.
Q13. Categorise the blood vessels based on the thickness off their wall. Draw well labeled diagram and give the function of each.
Q14. Make a list of the different blood vessels you have studied in this chapter. Write the parts of the heart, from where they arise and the parts of the body supplied by them.
Q15. How does circulation of blood take place in the body? Write down all the steps in a sequential order.
Q16. Explain the ABO and Rh grouping of human blood.

Chapter-19: Excretory Products and Their Elimination

Case-Based Questions:

Q1. In humans, the excretory system consists of a pair of kidneys one pair of ureters, a urinary bladder and a urethra. Kidneys are reddish brown, bean shaped structures situated between the levels of last thoracic and the third lumbar vertebra close to the dorsal inner wall of abdominal cavity. Each kidney has nearly 1million complex tubular structure called nephrons, which are the fundamental units. Each nephron has two parts- the glomerulus and the renal tubule. Glomerulus is a tuft of capillaries formed by the afferent arteriole- a fine branch of renal artery. Blood from the glomerulus is carried away by an efferent arteriole.



Read the passage carefully and answer the following questions:

i. Inner side to the hilum is a broad funnel shaped cavity space is present, it is known as ___.
a. Renal pelvic
b. Renal pelvis.
c. Renal tubule.
d. DCT.

ii. Blood from tuft of capillaries is carried away by.
a. Afferent arteriole.
b. Branch of renal artery.
c. Efferent arteriole.
d. PCT.

iii. When kidney of a person is damaged he or she invariably suffers from_____.
a. RBC pass through the glomerulus.
b. sufficient erythropoietin is not produced.
c. haemoglobin is not synthesised sufficiently.
d. iron and vitamin B12 are not able to bind to hemoglobin.

iv. Which of the following is true for excretion in humans?
a. glucose and amino acids are reabsorbed in PCT by simple diffusion.
b. DCT is impermeable to water.
c. On an average, 25 to 30 gram of urea is excreted out per day.
d. maximum reabsorption occurs in the loop of Henle.

v. Dialysing unit contains a fluid which is almost same as plasma except that it has _____.
a. high glucose. b. high urea.
c. no urea. d. high uric acid.

Objective type Questions:

Q2. In mammals, which blood vessel would normally carry largest amount of urea?
a. Renal Vein b. Dorsal Aorta
c. Hepatic Vein d. Hepatic Portal Vein

Q3. In which part of the uriniferous tubule, absorption of glucose occurs?
a. Collecting tube b. Henle's loop
c. Distal convoluted tubule d. Proximal convoluted tubule

Q4. Which of the following are uricotelic animals?
a. Rohu and frog b. Camel and frog
c. Lizard and crow d. Earthworm and eagle

Q5. Assertion: In vertebrates, the liver is also referred to as accessary excretory organ.
Reason: Liver helps kidney in the secretion of urine.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: Malpighian tubules are excretory organs in most of the insects.
Reason: These help in a excretion of urea and creatinine.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short answer type questions:

Q7. How does ANF cause a decrease in the blood pressure?
Q8. Write the significance of the sebaceous gland.
Q9. Describe the role of Renin-angiotensin in the management of kidney function.
Q10. Categorize organisms based on their excretory products. Give examples.
Q11. Define micturition reflex. Explain how does it regulate micturition.

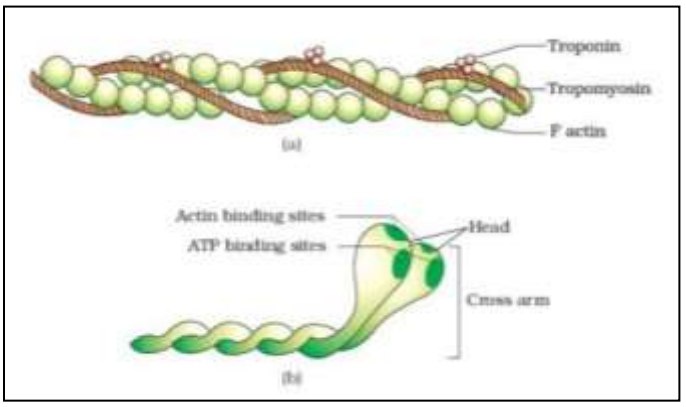
Long answer type questions:

Q12. Describe the structure of a human kidney with the help of a well labelled diagram.
Q13. Sort the following into actively or passively transported substances during reabsorption of GFR. Glucose, amino acids, nitrogenous wastes, Na^+, water.
Q14. Mention the substances that exit from the tubules in order to maintain a concentration gradient in the medullary interstitium.
Q15. Describe the working and principle of dialysis machine. Under what conditions, a patient is put on this machine?
Q16. Define counter current mechanism? How does it differ in PCT and vasa recta? Write the significance of this mechanism.

Chapter-20: Locomotion and Movement

Case-Based Questions:

Q1. Myosin filament is a polymerized protein. Many monomeric proteins called meromyosin constitute one thick filament. Myosin molecule consist of two heavy chains coiled around each other forming double helix. One end of each of these chains is projected outwardly. It is known as crossbridge. This end is folded into a globular protein mass called myosin head. Two light chains are associated with each other head. Myosin head has a special ATPase activity. It can split ATP to produce energy. Myosin contributes 55% of muscle protein. Actin filament also are complex type of contractile protein. It consists of three different components i.e. F actin, Troponin and Tropomyosin.



Read the passage carefully and answer the following questions:

i. How many chains are associated with the myosin head?
   a. 2 heavy meromyosin. b. 2 light meromyosin.
   c. 4 light meromyosin. d. 4 heavy meromyosin.

ii. Which of the following protein is called as backbone of actin filament?
   a. F actin. b. G actin.
   c. T actin. d. Tropomyosin.

iii. In humans during muscle contraction, the _____.
   a. actin filaments shorten. b. A, I and H bands shorten.
   c. A band remains the same. d. sarcomere does not shorten.

iv. The contractile protein of skeletal muscle involving ATPase activity is_____.
   a. Troponin. b. Tropomyosin.
   c. Myosin. d. Alpha Actin.

v. Calcium is important in skeletal muscle contraction because it_____.
   a. binds to troponin to remove the masking of active sites on actin for myosin.
   b. activates the myosin ATPase by binding to it.
   c. detaches is the myosin head from the actin filament.
   d. prevents the formation of bonds between the myosin cross bridges and the actin filament.

Objective type Questions:

Q2. Which of the following hormones can play a significant role in osteoporosis?
   a. Estrogen and parathyroid hormone b. Aldosterone and prolactin
   c. Parathyroid hormone and prolactin d. Progesterone and aldosterone

Q3. The pivot joint between atlas and axis is a type of_____.
   a. Fibrous joint b. synovial joint
   c. saddle joint d. cartilaginous joint

Q4. ATPase of the muscle is located in_____.
   a. Actinin. b. Troponin.
   c. Myosin. d. Actin.

Q5. Assertion: Calcium is required for skeletal muscle contraction.
Reason: Calcium influx releases acetylcholine at neuro muscular junction.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: Inflammation of a skeletal joint may in immobilise the movements of the joint.
Reason: Uric acid crystals in the joint cavity and ossification of articular cartilage lead to this.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short answer type questions:

Q7. Enumerate four functions of skeletal system.

Q8. How does skeletal system help in hematopoiesis?

Q9. Write the significance of occipital bones of skull.

Q10. Exchange of calcium between bone and extracellular fluid take place under the influence of certain hormones:
i. What will happen if more of Ca^{++} is in extracellular fluid?
ii. What happened if very less amount of Ca^{++} is in the extracellular fluid?

Q11. Compare the components of thin filament and thick filament of a muscle fiber.

Long answer type questions:

Q12. Describe isotonic and isometric contractions.

Q13. Draw the diagram of a myosin monomer.

Q14. Categorise joints based on their structure. Give one example of each.

Q15. Explain the difference between hinge joint and, ball and socket joint with the help of a diagram.

Q16. Calcium ion concentration in blood affects muscle contraction. Does it lead to tetany in certain cases? How will you correlate fluctuation in blood calcium with tetany?

Chapter-21: Neural Control And Coordination

Case-Based Questions:

Q1. The brain is the central information processing organ of our body, and act as the command and control system. It is divided into three major parts: forebrain, midbrain and hindbrain. The forebrain consists of cerebrum, thalamus and hypothalamus. Cerebrum forms the major part of the human brain. A deep cleft divides the cerebrum longitudinally into two halves, which are termed as left and right cerebral hemispheres. The hemispheres are connected by a tract of nerve fibers called corpus callosum. The layer of cells which covered the cerebral hemisphere is called cerebral cortex and is thrown into prominent folds. The cerebral cortex is referred to as the gray matter due to its grayish appearance.
The neuron cell bodies are concentrated here giving the color. The cerebral cortex contains motor areas, sensory areas and large regions that are neither clearly sensory nor motor in function.
Read the passage carefully and answer the following questions:

i. Left cerebral hemispheres and right cerebral hemispheres are connected by _____.
   a. Cerebral cortex. b. Neurosecretory cells.
   c. Tract of nerve fibers. d. Limbic lobe.

ii. Myelin sheath is also known as _____.
   a. Grey matter. b. White matter.
   c. Corpus callosum. d. Dura matter.

iii. The capability of an individual to maintain a stable, relatively constant internal environment is called_____.
   a. homeostasis. b. hemostasis.
   c. chemical coordination. d. neural coordination.

iv. The human hind brain comprises three parts, one of which is_____.
a. Cerebellum. b. Hypothalamus.
c. Spinal. d. Corpus callosum.

v. Which of the following regions of the brain is incorrectly paired with its function?
a. Medulla oblongata-Homeostatic control
b. Cerebellum-Language comprehension
c. Corpus callosum-Communication between the left and the right cerebral cortices.
d. Cerebrum-Calculation and contemplation.

Objective type Questions:

Q2. Chemicals which are released at the synaptic junctions are called_____.
a. Hormones. b. Neurotransmitters.
c. Cerebrospinal fluid. d. Lymph.

Q3. Node of Ranvier occurs where _____.
a. nerve is covered myelin.
b. neurolemma is discontinuous.
c. neurolemma and myelin sheath are discontinuous.
d. myelin sheath is discontinuous.

Q4. Stimulation of a muscle fibre by a motor neuron occurs at _____.
a. the neuromuscular junction. b. the transverse tubules.
c. the myofibril. d. the sarcoplasmic reticulum.

Q5. Assertion: All motor neurons are efferent neurons.
Reason: Motor neurons conduct nerve impulses from the spinal cord to the brain.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: The imbalance in concentration of Na^+, K^+ and proteins generates resting potential.
Reason: To maintain the unequal distribution of $Na^+$and K^+, the neuron use electrical energy.
a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short answer type questions:

Q7. Write the importance of the myelin sheath present around the axon.

Q8. How are cerebrum and cerebellum different in terms of functions?

Q9. If someone receives a blow on the back of neck, what would be the effect on the person's CNS?

Q10. Classify the neurons based on their structure and functions.

Q11. Neural system and computers share certain common features. Comment in five lines?

Long answer type questions:

Q12. Explain the transmission of a nerve impulse across a chemical synapse.

Q13. Draw a labelled diagram of human brain.

Q14. Describe the phenomena of release and transport of a neurotransmitter.

Q15. Explain the mechanism of generation of action potential and how does it help in conduction of nerve impulse through neurons?

Q16. Differentiate between the polarized and depolarized nerve. Explain the significance of different states of the nerve with respect to the transmission of nerve impulses.

Chapter-22: Chemical Coordination And Integration

Case-Based Questions:

Q1. Seema was losing weight rapidly. She was often suffering from diarrhoea, muscle weakness, nervousness and fatigue. On advice of a doctor she got her blood tested for cell counts and haemoglobin. All the parameters were within normal range. her urine test was also normal.

She was worried and consulted an endocrinologist. He suggested some more blood tests and diagnosed a hormonal disorder.

Read the passage carefully and answer the following questions:

i. Which of the endocrine glands of seema is not functioning properly?

a. Adrenal. b. Pancreas.
c. Thymus. d. Thyroid.

ii. According to you, Seema was suffering from_____.

a. Diabetes mellitus. b. Simple Goitre.
c. Hyperthyroidism. d. Addison's disease.

iii. Which of these diseases is not related to the glandsin question?

a. Cretinism. b. Myxoedema.
c. Goitre. d. Acromegaly.

iv. Which of the following minerals is required for the normal functioning of above gland?

a. Calcium. b. Iodine.
c. Phosphorus. d. Potassium.

v. A temporary endocrine gland in the human body is_____.

a. Pineal gland. b. Corpus luteum.
c. Corpus allatum. d. Corpus cardiacum.

Objective type Questions:

Q2. Cortisol is secreted from_____.

a. Pancreas. b. Thyroid.
c. Adrenal. d. Thymus.

Q3. This hormone is not involved in sugar metabolism_____.

a. Glucagon b. Insulin
c. Cortisol d. Aldosterone

Q4. Artificial light, extended work- time and reduce- sleep time disrupt activity of_____.

a. Thymus gland. b. Adrenal gland.
c. Pineal gland. d. Posterior pituitary gland.

Q5. Assertion: After ovariectomy, menstrual cycle in women may be stopped.
Reason: Ovarian hormones induce menstrual cycle.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Q6. Assertion: Type-I diabetes is caused by destruction of beta cells of islets of Langerhans.
Reason: Insulin can be taken as pills.

a. If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
b. If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c. If Assertion is true but Reason is false.
d. If Assertion is false but Reason is true.

Short answer type questions:

Q7. How is Diabetes mellitus different from Diabetes insipidus?

Q8. Write the site of secretion of thyroxine and calcitonin.

Q9. Define hyperthyroidism and explain why one of its symptoms is weight loss.

Q10. Organs like the stomach and intestine are also endocrine glands. why?

Q11. Compare and contrast the role of estrogen and progesterone.

Long answer type questions:

Q12. How does hypothyroidism affect the maturation and development of a growing baby, generally seen during pregnancy?

Q13. Explain why hypothalamus is a super master endocrine gland?

Q14. The endocrine glands and hormone producing diffused cells/ tissues located in different parts of our body constitute the endocrine system. Many glands and hormones are a part of this system.

i. Which hormone regulates calcium balance in the body?
ii. Write the difference between endocrine and exocrine glands.
iii. What is meant by synergistic effect of hormones?
iv. Which condition will stimulate parathyroid gland to release parathyroid hormone?

Q15. Describe the feedback mechanism with an example.

Q16. Categorise hormones based on their chemical nature. Give examples of each category and write one important function of each one of them.