

Class: 11
Subject: Biology
No. of Questions: 30 (OASK1511SA01)
Duration : 3 hours
Maximum Marks = 100

Q1. What does identification mean?

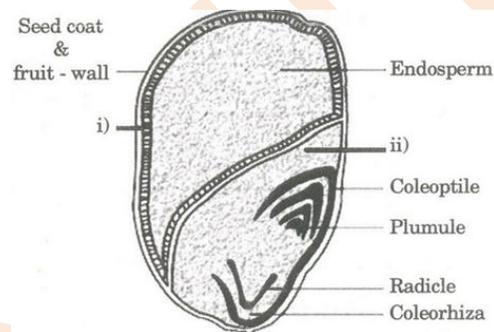
Sol. Identification means assigning an organism to a particular taxonomic group.

Q2. Why are brown algae brown?

Sol. The brown colour of these algae results due to dominance of xanthophyll pigment fucoxanthin. Which masks the other pigments?

Q3. Look at the figure below and label – 1

- (i) The part that separates the embryo from the endosperm.
- (ii) The shield shaped cotyledon.



Sol.

- (i) Aleurone layer and
- (ii) Scutellum.

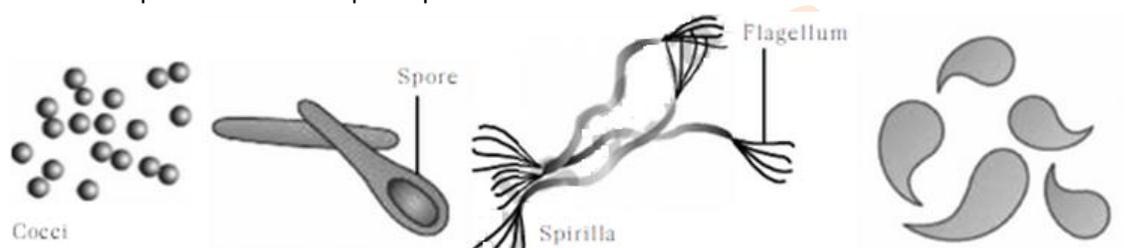
Q4. What is middle lamella?

Sol. A cementing layer of pectic materials holding together primary cell walls of adjacent cells is called middle lamella.

Q5. What are the four categories of bacteria based on their basic shapes?

Sol. The four categories bacteria based on their shapes:

- (i) Spherical coccus.
- (ii) Rod-shaped bacillus.
- (iii) Comma-shaped vibrium and spiral spirillum.



Q6. Explain the term exarch and endarch conditions of xylem.

Sol.

- (a) In roots, the protoxylem lies towards periphery and metaxylem lies towards the centre. Such arrangement of primary xylem is called exarch condition of xylem.
- (b) In stems, the protoxylem lies towards the centre and metaxylem lies towards the periphery. Such arrangement of primary xylem is called endarch condition of xylem.

Q7. Write a note on triglycerides.

Sol.

- (a) Triglycerides are glycerides in which the glycerol is esterified with three fatty acids.
- (b) They are the main constituents of vegetable oil and animal fats.
- (c) Glycerol is a C-alcohol with 3-OH groups that serve as binding sites.

OR

Explain haplontic and diplontic life cycles by giving examples

Sol. Haplontic life cycle

- (a) The haploid phase is dominant and the diploid phase is represented only by the zygote which undergoes meiosis.
(b) Embryo and sporophyte are absent.

Diplontic lifecycle

The diploid phase is dominant and few celled gametophytes are the only haploid phase in the life cycle.

Q8. Differentiate between primary meristem and secondary meristem. (HOTS)

Sol.

	Primary meristem	Secondary meristem
(i)	It develops from promeristem.	It develops from permanent tissue that regains the power of division.
(ii)	It is formed in the beginning.	It is formed in later stage.
(iii)	It results in primary growth.	It results in secondary growth.
(iv)	It forms primary tissues except intrafascicular cambium.	

Q9. Enumerate the peculiar features that you find in phylum chordate.

Sol. The peculiar characteristics of the phylum chordate are:

- (i) The notochord is stiff and flexible rod of tissues lying ventral to nerve cord.
(ii) All the chordates are triploblastic. Coelomate and bilaterally symmetrical.
(iii) They possess a post anal tail and closed blood vascular system.
(iv) Presence of a dorsal hollow nerve cord and paired pharyngeal gill slits.

Q10. What are the muscle tissues? What are the three types of muscles found in human beings?

Sol.

- (i) Each muscle is made of many long. Cylindrical fibres arranged in parallel arrays. These fibres are composed of numerous fine fibrils. Called myofibrils.
(ii) Muscle fibres contract (shorten) in response to stimulation. Then relax (lengthen) and return to their uncontracted state in a coordinated fashion. Their action moves the body to adjust to the changes in the environment and to maintain the positions of the various parts of the body.
(iii) In general, muscles play an active role in all the movements of the body. Muscles are of three types, skeletal, smooth. And cardiac.

Q11. List various function of epithelia tissue.

Sol. The various functions of epithelial tissues are:

- (i) Protection – The epithelial tissue protects the underlying tissue from injury. Chemicals. Bacteria etc.
- (ii) Sensation – The specialized epithelial tissue consisting of sensory nerve endings are found in the skin. Eyes, nose, ears and the tongue.
- (iii) Secretion – The epithelial tissue secretes definite chemical substances such as enzymes, hormones and lubricating fluids.
- (iv) Absorption – The epithelial tissue lining the small intestine absorb nutrients from the digestion of food.
- (v) Excretion – The epithelial tissue in kidney excretes waste products from the body and reabsorbs needed materials from the urine.
- (vi) Diffusion – Simple epithelium helps in diffusing gases, liquids, nutrients etc.

Q12. Describe the process of crossing over. What is its significance?

Sol. In pachytene stage of prophase I in Meiosis I. the bivalent chromosomes clearly appear as tetrads. This stage is characterized by the appearance of recombination nodules. The sites at which crossing over occurs between non-sister chromatids of the homologous chromosomes.

Crossing over is the exchange of genetic material between two homologous chromosomes. Crossing over is also an enzyme-mediated process and the enzyme involved is called recombinase.

Significance:

Crossing over leads to recombination of genetic material on the two chromosomes. Recombination between homologous chromosomes is completed by the end of pachytene, leaving the chromosomes linked at the sites of crossing over.

Q13. Describe the structure of chloroplast.

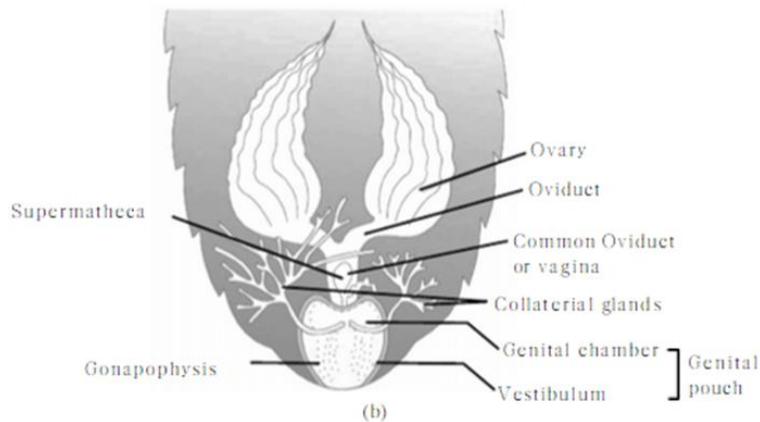
Sol. The chloroplasts of the green plants are found in the mesophyll cells of the leaves. These are lens-shaped, oval, spherical, discoid or even ribbon-like organelles having variable length (5-10 mm) and width (2-4 mm). The chloroplasts are double membrane bound. Of the two, the inner chloroplast membrane is relatively less permeable. The space limited by the inner membrane of the chloroplast is called the stroma. A number of organized flattened membranous sacs called the thylakoids are present in the stroma (Figure). Thylakoids are arranged in stacks like the plies of coins called grana (singular: granum) or the inter-granal thylakoids. In addition, there are flat

membranous tubes called the stroma lamellae connecting the thylakoids of the different grana. The membrane of the thylakoids encloses a space called a lumen. The stroma of the chloroplast contains enzymes required for the synthesis of carbohydrates and proteins. It also contains small, double-stranded circular DNA molecules and ribosomes. Chlorophyll pigments are present in the thylakoids. The ribosomes of the chloroplasts are smaller (70S) than the cytoplasmic ribosomes (80S).

OR

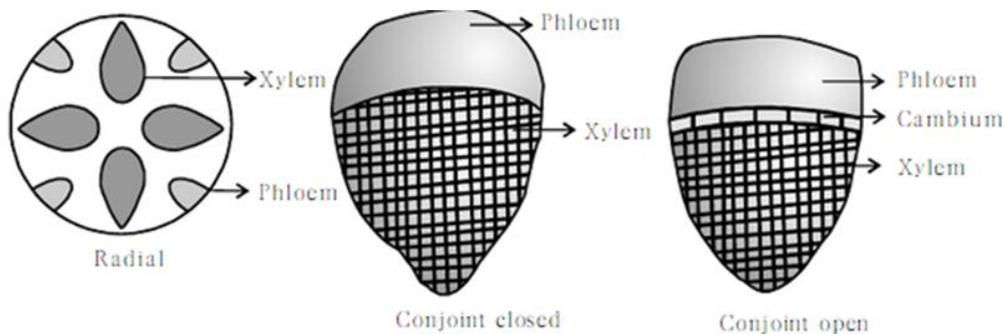
Draw a labelled diagram of female reproductive system of a cockroach.

Sol.



Q14. Draw any three figures of various types of vascular bundles found in angiosperms.

Sol.



Q15. Describe the structure of Golgi apparatus.

Sol.

- (i) Camillo Golgi (1898) first observed densely stained reticular structures near the nucleus. These later named Golgi bodies after him. They consist of many flat. Disc-shaped sacs of cisternae of 0.5 m to 1.0 m diameter.
- (ii) These are stacked parallel to each other. Varied number of cisternae is present in a Golgi complex. The Golgi cisternae are concentrically arranged near the nucleus with distinct convex cis or the forming face and concave trans or the maturing face. The cis and the trans faces of the organelle entirely different, but interconnected.
- (iii) The Golgi apparatus principally performs the function of packaging materials, to be delivered either to the intra-cellular targets or secreted outside the cell. Materials to be packaged in the form of vesicles from the ER fuse with the cis face of the Golgi apparatus and move towards the maturing face.
- (iv) This explains why the Golgi apparatus remains in close association with the endoplasmic reticulum. A number of proteins synthesized by ribosomes on the endoplasmic reticulum are modified in the cisternae of the Golgi apparatus before they are released from its trans face. Golgi apparatus is the important site of formation of glycoproteins and glycolipids.

OR

Schematically represent the stages in meiosis II.

Sol.

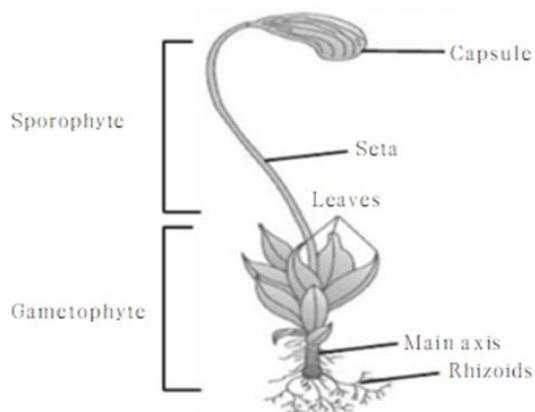
Q16. Draw a labelled diagram of a bacteriophage.

Sol.

OR

Draw a labeled diagram of a funaria plant.

Sol.



Q17. Mention two functions of calcium in meristems and zinc in plants.

Sol. Calcium:

- (i) For the formation of spindles during cell wall.
- (ii) For the formation of middle lamella.

Zinc:

- (i) For the synthesis of auxin.
- (ii) For the activation of carboxylases.

Q18. What is diatomaceous earth? Mention two uses of it.

Sol. It refers to the deposits of the indestructible siliceous cell wall of diatoms in the ocean floor.

Uses:

- (i) As an absorbent for liquid nitroglycerine to make explosives.
- (ii) For filtering the liquids in sugar factories.
- (iii) As inert extender in paints.
- (iv) For insulation in boilers and blast furnace.
- (v) In powdered form as abrasive silver polish and tooth paste.

Q19. What are cell junctions? Name the different types of them.

Sol. These are the structures which hold the cells of tissue together. When they are not widely separated by extracellular material. The three types of cell junctions are: Tight junctions. Adhering junctions and Gap junctions.

Q20. Multicellular organisms show division of labour. Discuss.

Sol. Division of labour is the phenomenon in which different cells or tissues of the multicellular organism perform different life functions. Multicellular organisms have cells organized into tissues. Organs, organ system, each of which performs a particular function> Example- alimentary canal helps in digestion.

Q21. Differentiate osteichthyes and chondrichthyes. (HOTS)

Sol.

	Chondrichthyes	Osteichthyes
(i)	The endoskeleton is cartilagenous.	The endoskeleton is bony.
(ii)	Mouth is ventral.	Mouth is terminal.
(iii)	Tail fin is heterocercal.	Tail fin is homocercal.
(iv)	Air bladder is absent.	Air bladder is present.
(v)	Operculum is absent.	Operculum is present.
(vi)	Fertilization is internal.	Fertilization is external.

Q22. Describe competitive inhibition of enzyme activity with an example.

Sol. It is the phenomenon in which a substance closely resembling the substrate in its molecular structure competes with it for the active site on the enzyme. Eg – Malonate resembles succinate in its structure and inhibits the action of succinate dehydrogenase. Competitive inhibition is used in the control of bacterial pathogens.

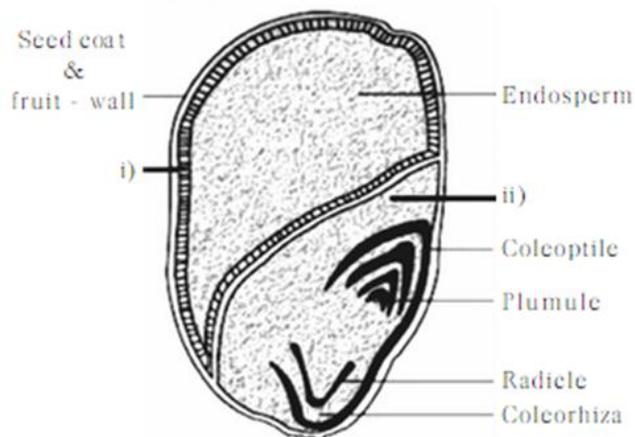
Q23. Draw a labeled diagram of the mouth parts of cockroach.

Sol.

OR

Draw a labeled diagram of structure of monocot seed.

Sol.



Q24. All chordates are not vertebrates but all vertebrates. Justify. Name the two classes of the phylum vertebrata.

Sol. All chordates have a notochord. But only in vertebrates, the notochord is replaced by vertebral column. Since vertebrates have a notochord in the embryonic stages they are chordates. So all the vertebrates are chordates but not all chordates are vertebrates. Sub phylum vertebrata –

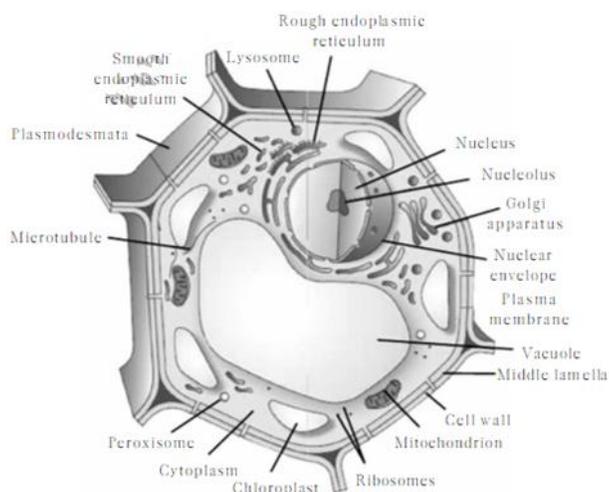
- (i) Agnatha and
- (ii) Gnathostomata.

Q25. Describe the quaternary structure of protein.

Sol. When a protein has many subunits (polypeptide chains), each having a primary, secondary or tertiary structure of its own, the protein is said to be in its quaternary structure. Examples – Myoglobin, Haemoglobin.

Q26. Draw a plant cell and label ten parts in it.

Sol.



Q27. What are cofactors? Name two types of cofactors.

Sol. The non-protein moiety of a conjugate enzyme is called a cofactor. It makes the protein catalytically active. It is are of three types namely. Prosthetic group, coenzyme and metal ions, (Any two)

Q28. What is activation energy? What effect does an enzyme have on activation energy?

Sol. For any chemical reaction to take place, a new bond must form. The energy needed to break the old bond is called the activation energy. Many reactants need a large amount of energy to push them to take part in a reaction. In the presence of enzymes, the activation energy is greatly lowered allowing the reaction to take place at low temperature. The halfway point in reaction is called the transition state. The transition state represents the stage when the new bonds are formed. Enzymes lowers the activation energy by making it easier to achieve the transition state.

Q29. Differentiate gram-positive and gram-negative bacteria.

Sol.

	Gram-negative	Gram-positive
(i)	Cell wall is 20-80 nm thick.	Cell wall is 8-12 mm thick.
(ii)	It includes few pathogenic bacteria.	It includes most of the pathogenic bacteria.
(iii)	Mesosomes are prominent.	Mesosomes are less prominent.
(iv)	Have single-layered wall.	Have double-layered wall.

(v)	Outer membrane is absent.	Outer membrane is present.
(vi)	The bacterial remain colour blue or purple with gram staining even after washing with alcohol.	The bacteria do not retain stain when washed with alcohol.

Q30. How does mustard inflorescence differ from the banana inflorescence in arrangement? (HOTS)

Sol. Mustard shows raceme inflorescence in which the oldest bisexual flowers with longest pedicel remain at the base and young bisexual flowers with short pedicel remain near the tip of inflorescence axis. Banana shows spadix inflorescence in which the spike with fleshy axis is enclosed by one or more large spathe.