CBSE SAMPLE PAPER – 12 (Solved)

Class-XI

BIOLOGY (THEORY)

Time: 3 Hrs **MM: 70**

General Instructions

1. The question paper comprises of five Sections A, B, C, D and E.
2. All questions are compulsory.
3. There is no overall choice however; internal choice has been provided in one question of 2 marks, one question of 3 marks and all the two questions of five marks category. Only one option in such question is to be attempted.
4. Questions1 to 5 in section A are very short questions of one mark each. These are to be answered in one word or one sentence each.
5. Questions 6 to 9 in section B are short questions of two marks each. These are to be answered in approximately 20-30 words each.
6. Questions 10 to 20 in section C are questions of three marks each. These are to be answered in approximately 30-50 words each. Question 21 is of 4 marks.
7. Questions 22 to 23 in section D are questions of five marks each. These are to be answered in approximately 80-120 words each.
8. Questions 24 to26 in section E is based on OTBA of 10 marks.

Section – A

1. Define the term 'vernalization'.
2. What are the functions of major proteins?
3. Give two similarities of kingdom monera and protista.
4. Draw a labelled diagram of chara.
5. What are adventitious roots? Give examples.

Section – B

6. How is the gut lining protected from its own secretion of proteases?
7. What are the different ways in which specimens are kept in a museum?

Or

Differentiate between ascus and basidia, apart from the names of the groups producing them.

8. How does water scarcity affect the rate of photosynthesis?

9. What are kinetochores? What are their functions?

Section – C

10. Write any four differences between collenchyma and sclerenchyma.

11. Draw a labelled diagram of Nostoc.

12. Define RQ. Show its value for fats and carbohydrates.

13. Describe the nervous system of an earthworm.

Or

Draw a labelled diagram of the female reproductive system of frog.

14. What was Van Niel's experiment? What was the finding from it? Give the equation of photosynthesis given by him.

15. Write six distinguishing features of class Mammalia.

16. Describe the quaternary structure of proteins.

17. Describe the auto-regulation of GFR.

18. Draw the diagram of six different shapes of the cells.

19. How is the gut lining protected from its own secretion of proteases?

20. What are the different ways in which specimens are kept in a museum?

21. Prabha has seen huge garbage dumps outside her school which are not being regularly disposed by the municipal corporation official. Prabha discuss the problems with school mates and decided to organize rally to spread aw arness among the local people about public hygiene.

a. What values do you find in Prabha?

b. Why public hygiene is essential?

c. Name two disease that spread due to improper public hygiene?

Section – D

22. Write a note on imbibitions.

Or

a) Schematically represent the water movement in the leaf.

b) Draw a labelled diagram showing apoplast and symplast pathway.

23. Write a note on dicotyledonous seed.

Or

Draw the structure of human brain.

Section-E (OTBA) Questions

24.	OTBA Question	2 mark
25.	OTBA Question	3 mark
26.	OTBA Question	5 mark

CBSE SAMPLE PAPER – 12 (Solved)

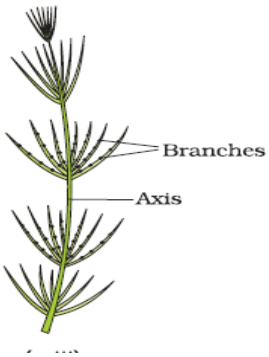
Class-XI

BIOLOGY (THEORY)

Time: 3 Hrs **MM: 70**

ANSWERS

Section-A

1. There are plants for which flowering is either quantitatively or qualitatively dependent on exposure to low temperature. This phenomenon is termed vernalisation.
2. Fibrinogen, globulins and albumins are the major proteins. Fibrinogens are needed for clotting or coagulation of blood. Globulins primarly are involved in defense mechanisms of the body and the albumins help in osmotic balance.
3. Both monera and protista contain species having unicellular organism and predominantly aquatic organism.
4. 

5. In some plants, like grass, Monstera and the banyan tree, roots arise from parts of the plant other than the radicle and are called adventitious roots.

Section-B

6. Proteases are secreted in inactive form and pose no threat to the gut lining. The mucus provides protection to the epithelial lining.
7.

a) The specimens are kept in suitable chemical solutions.

b) Plant and animal specimens are also preserved as dry specimens.

c) Insects are normally dried and pinned in the insect boxes.

d) Larger animals (birds, mammals) are preserved as stuffed specimens.

Or

Ascus	Basidia
Spores are produced endogenously	Spores are produced exogenously
Eight spores are inside an ascus	Four spores are produced by a basidium

8. When water is the limiting factor, photosynthesis is affected as – the stomata close and entry carbon dioxide is restricted and the cells lose their turgidity and so leaves are not fully exposed to light.

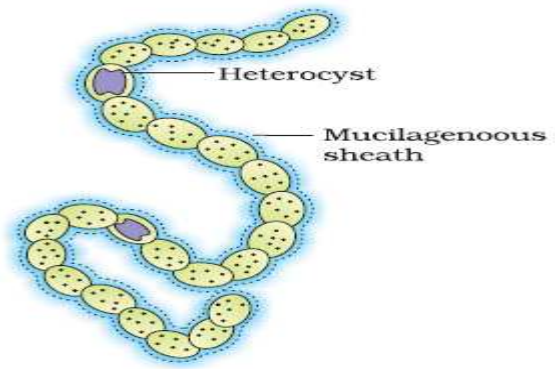
9. Kinetochores are small disc-shaped structures at the surface of centromere. They serve as the sites of attachment of the spindle fibres to the centromere of chromosomes

Section-C

10.

Collenchyma	Sclerenchyma
The cells are alive at maturity	The cells are dead at maturity
Cell wall is unevenly thickened, thickening are prominent in the corners.	Cell wall is unevenly thickened; sometimes lumen in obliterated.
It gives strength and flexibility to growing organs	It gives mechanical support to the organ and the fibres are used for making opes / threads.
It may posses chloroplates and photosynthesis	It never possesses chloroplasts.

11.



12. Respiratory quotient is defined as the ratio of the volume of carbon dioxide evolved to the volume of oxygen consumed in respiration. RQ varies with the respiratory substrates, as shown below:

(i) When a carbohydrate is the respiratory substrate the RQ is one

$$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + \text{Energy}$$

$$RQ = \frac{6CO_2}{6O_2} = 1.0$$

(ii) When fats are the respiratory substrate the RQ is less than one.

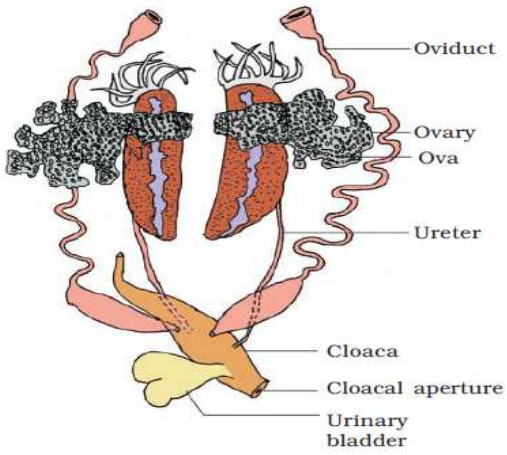
$$2(C_{51}H_{98}O_6) + 145O_2 \longrightarrow 102CO_2 + 98H_2O + \text{energy}$$

Tripalmitin

$$RQ = \frac{102CO_2}{145O_2} = 0.7$$

13. A brain is formed by the fusion of a pair of suprapharyngeal / cerebal ganglia; it lies in the anterior and dorsal part of the third segment. It is connected to two sub-pharyngeal ganglia' lying below the pharynx, with the help of a pair of ircumpharyngeal connectives, which form a nerve ring. A double ventral nerve cord runs up to the last segment. Ganglia are segmentally arranged on the nerve cord and they give of nerves tot eh organs of that segment.

Or



14. He employed purple and green photosynthetic bacteria. He demonstrated that photosynthesis is essentially a light-dependent reaction in which hydrogen from a suitable oxidisable compound reduces carbon dioxide to carbohydrates.

    This can expressed as $2\ H_2A + CO_2 \rightarrow 2\ A + CH_2O + H_2O$.

    Green plants, water is the hydrogen donor as it is oxidised to oxygen. Photosynthetic bacteria used hydrogen sulphide (H_2S) as hydrogen donor and so the oxidation product is sulphur or sulphate depending on the organism.

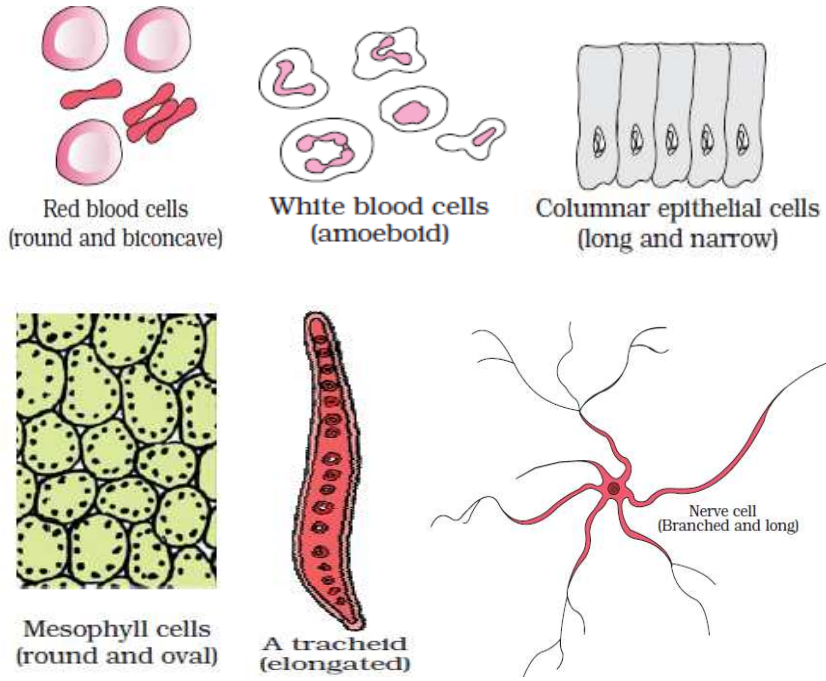
15.

(a) Presence of mammary glands is a characteristic feature, they are functional in females and vestigial in males.
(b) External ear is present.
(c) Trunk is internally partitioned by a muscular diaphragm into thoracic and abdominal cavities.
(d) Skin possesses sweat glands and sebaceous glands; skin has hair a unique feature of the class.
(e) Heart is four – chambered with two auricles and two ventricles, there is double circulation.
(f) Animals are viviparous and give birth to young ones. The foetus is nourished by the mother through the placenta.

16. When a protein has many subunits (polypeptide) each having a primary , secondary or tertiary structure of its own, the protein is said to be in its quaternary structure. E.g Haemoglobin, Insulin, Myoglobin.

17. Juxta glomercular apparatus (JGA) is a specialized cellular structure located where the distal convoluted tubule passes close to the Bowman's capsule near the afferent article, where the two come in contact with each other. A fall in the GFR activities the cells of TGA to release rennin. Rennin acts through a complex series of reactions called rein-angiotension-aldosterone mechanism. This increases the blood volume and blood pressure and the GFR is brought back to normal.

18.



19. Proteases are secreted in inactive form and pose no threat to the gut lining. The mucus provides protection to the epithelial lining. The juice secreted by gastric gland contain mucus that help protection of inner layer of gut.

20.

a) The specimens are kept in suitable chemical solutions.

b) Plant and animal specimens are also preserved as dry specimens.

c) Insects are normally dried and pinned in the insect boxes.

d) Larger animals (birds, mammals) are preserved as stuffed specimens.

21.

a) Prabha is very concerned about the society and hygiene of locality.

b) The public hygiene is essential to prevent the spread of disease and make the surrounding neat and clean.

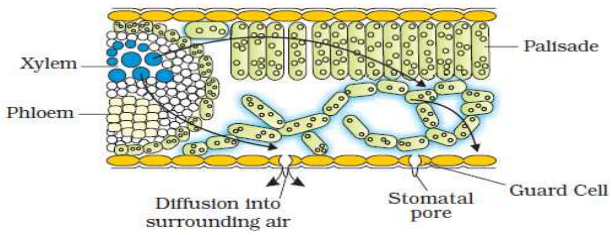
c) Disease like malaria and cholera spread due to unhygienic condition.

Section-D

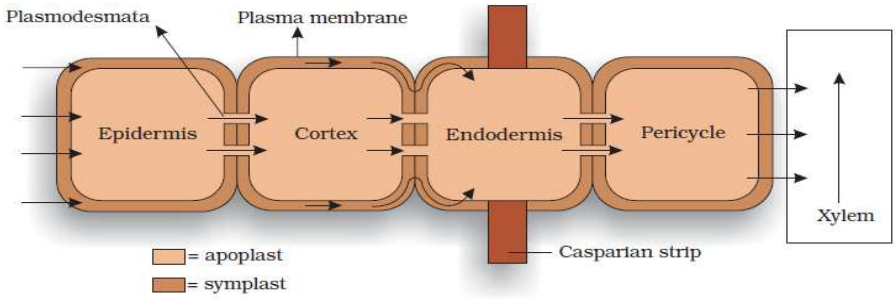
22. Imbibition is a special type of diffusion when water is absorbed by solids – colloids – causing them to enormously increase in volume. The classical examples of imbibition are absorption of water by seeds and dry wood. The pressure that is produced by the swelling of wood had been used by prehistoric man to split rocks and boulders. If it were not for the pressure due to imbibition, seedlings would not have been able to emerge out of the soil into the open. Imbibition is also diffusion since water movement is along a concentration gradient; the seeds and other such materials have almost no water hence they absorb water easily. Water potential gradient between the absorbent and the liquid imbibed is essential for imbibition. In addition, for any substance to imbibe any liquid, affinity between the adsorbant and the liquid is also a pre-requisite.

Or

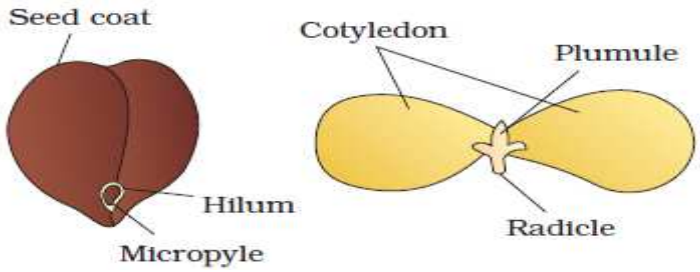
a)



b)



23. The outermost covering of a seed is the seed coat. The seed coat has two layers, the outer testa and the inner tegmen. The hilum is a scar on the seed coat through which the developing seeds were attached to the fruit. Above the hilum is a small pore called the micropyle.



Within the seed coat is the embryo, consisting of an embryonal axis and two cotyledons. The cotyledons are often fleshy and full of reserve food materials. At the two ends of the embryonal axis are present the radicle and the plumule. In some seeds such as castor the endosperm formed as a result of double fertilisation, is a food storing tissue. In plants such as bean, gram and pea, the endosperm is not present in mature seeds and such seeds are called non-endospermous.

Or