Sample Paper – 02
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. Show the taxonomic categories in hierarchical arrangement in ascending order.
2. What are uricotelic animals? Give example.
3. Define metamerism. Give an example.
4. Give an example of zwitter ionic form.
5. Draw a graph of oxygen dissociation curve.

Section – B

6. Define guttation, hydathodes and transpiration.
7. What is Glycolysis? Name two monosaccharide which readily enter the glycolytic pathway.

Or

Differentiate cytokinesis in plant cell and cytokinesis in animal cell.

8. What is the role of HCl in protein digestion?
9. What are the stilt roots? Give two examples.

Section – C

10. Draw the labelled diagram of circulatory system of cockroach.
11. Describe competitive inhibition of enzyme activity with an example?
12. Write a short note on euglenoids with the structure of Euglena.
13. Give all the six classes of enzymes.
14. What is phyllotaxy? Give one difference between racemose and cymose inflorescence.
15. Relate the following with the phylum: radial symmetry, haemocoel, water vascular system, setae, pneumatic bones and radula.
16. Draw a labelled diagram of fluid mosaic model of plasma membrane.

Or

Draw the floral diagram of fabaceae.

17. Explain with examples the three categories of plants based on photoperiodism.
18. Explain mechanism of transpiration in plants?
19. Give the names of 4 classes of kingdom fungi.
20. Give 4 differences between cyclic and non-cyclic photophosphorylation
21. Joy loves to play football and was selected as captain of the school team for the district level tournament. He also does social work. He attended a blood donation camp to donate blood and came to know that he was HIV positive. He lost interest in games and refused to play or study. He started counting his days. He remained absent from school for a long time. The Biology teacher visited his house and counselled him. Joy was back at school and also played the tournament.
    (a) What sense of responsibility did the Biology teacher exhibit?
    (b) A person detected to be HIV positive should be isolated in the society? Do you agree? Why/ Why not?
    (c) How is AIDS spread?

Section – D

22. Write a note on imbibitions? Explain the mechanism of it in brief.

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. With well labelled diagram

Or

Draw the structure of human brain and label it accurately?

Section-E (OTBA) Questions

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

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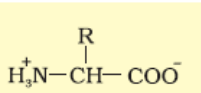
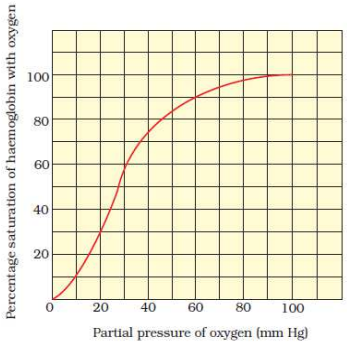
Answers

Section- A

1. 

2. Reptiles, birds, land snails and insects excrete nitrogenous wastes as uric acid in the formof pellet or paste with a minimum loss of water and are called uricotelicanimals.
3. In some animals, the body is externally and internally divided into segments with a serial repetition of at least some organs is called metamerism. Eg – Earthworm.
4. 

5. 

Section-B

6. Transpiration is the loss of surplus water in the form of water vapour from the aerial surface of plants.
   Guttation is the loss of water in the form of water droplets.
   When guttation takes place from venial ends called hydathodes.
7. It is the process in which one molecule of glucose is broken down into two molecules of pyruvic acid. Glucose and fructose enter the glycolytic pathway.

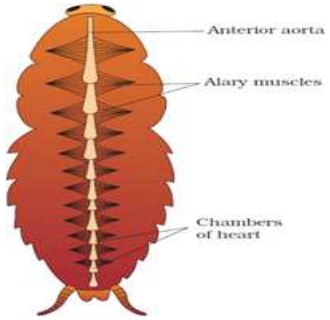
Or

Cytokinesis in Plant Cell	Cytokinesis in Animal Cell
It occurs by the formation of cell plate.	It takes place by furrowing or cleavage.
Cell plate grows centrifugally.	Cleaves progresses centripetally.
Cell plate is formed between the new nuclei and then expands outward to join with the old membranes.	A cleavage is formed around the middle.

8. It maintains a strongly acidic pH of about 1 – 2 in the stomach.
   (a) It converts inactive pepsinogen to pepsin.
   (b) It denatures many food proteins. This helps in pepsin action.
   (c) It kills bacteria.
9. The stilt roots are adventitious roots which arise in clusters from the basal nodes just above the ground providing support to the plants. Examples – maize and sugarcane.

Section-C

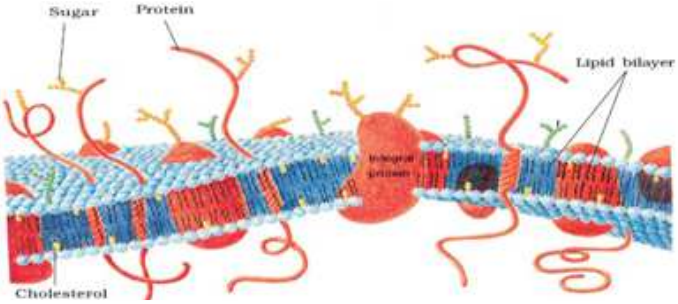
10.



11. 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.
12. Instead of a cell wall, they have a protein rich layer called pellicle which makes their body flexible. They have two flagella, a short and a long one. Though they are photosynthetic in the presence of sunlight, when deprived of sunlight they behave like heterotrophs by predating on other smaller organisms. Interestingly, the pigments of euglenoids are identical to those present in higher plants. Example: Euglena.
13. Class I – Oxidoreductases, Class II – Transferases, Class III – Hydrolases, Class IV – Lyases, Class V – Isomerases and Class VI – Ligases.
14. Phyllotaxy refers to the mode of arrangement of leaves on stem or branch.

Racemose Inflorescence	Cymose Inflorescence
Flower opening is centripetal.	Flower opening is centrifugal.
The terminal bud continues to grow.	The terminal bud forms a flower.
Flowers are arranged in an acropetal order.	Flowers are arranged in a basipetal order.

15. Radial symmetry: Echinodermata, Haemocoel: Arthropoda, water vascular system: Echinodermata, Setae: Annelida, Pneumatic bones: Chordata and Radula : Mollusca.
16.



Or

17. Plants are grouped into the following three categories:
    (a) Short-day plants – These plants which need a light shorter than their critical photoperiods for flowering. Egs – Chrysanthemum, Cosmos.
    (b) Long-day plants – These plants which need light period longer than their critical photoperiods for flowering. Egs – Wheat, barley.
    (c) Intermediate-day plants – These plants are not influenced by length of light period for flowering. Egs – Tomato, cucumber.
18.

19. The four classes of kingdom fungi are: Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes.
20.

Cyclic photophosphorylation	Non-cyclic photophosphorylation
The electrons emitted by PSI come back to same PSI cholorphyll.	The electrons emitted by PSII do not come back to same PSII.
It involves PSI.	It involves PSII.
It forms 2 ATP molecules.	It forms one ATP molecules.
No photolysis or NADPH occurs.	There is photolysis of water and production of NADPH.
Oxygen is not liberated.	Oxygen is liberated.

21. (a) The Biology teacher shows his responsibility properly by giving right suggestion.

(b) No, the HIV positive person should not be isolated from society. He must given social and moral support.

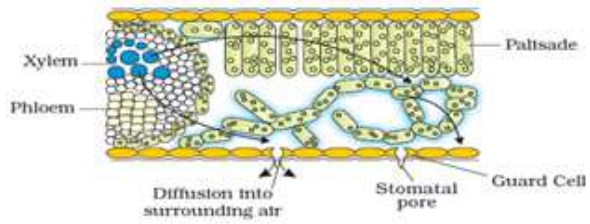
(c) AIDS spread through sex with multiple partners, from mother to foetus and contaminated blood.

Section-D

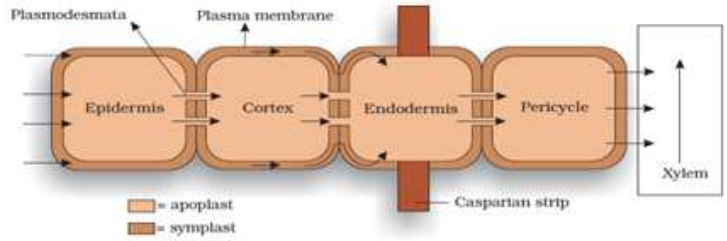
22. Imbibition is a special type of diffusion when water is absorbed by solids – colloids – causing them to enormously increase in volume. The classical examples of imbibition are absorption of water by seeds and dry wood. The pressure that is produced by the swelling of wood had been used by prehistoric 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

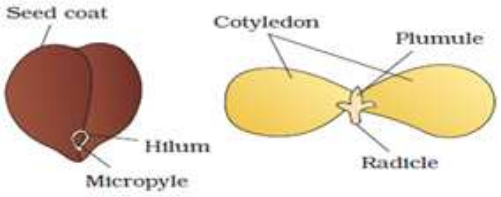
(a)



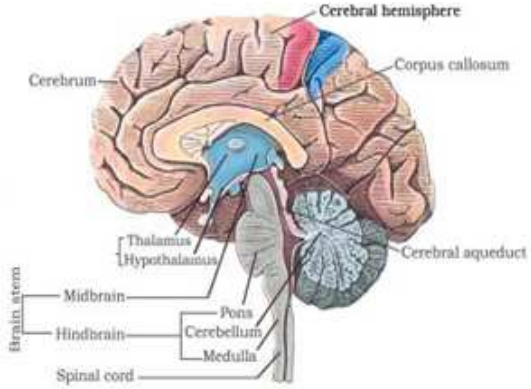
(b)



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.


Seed coat
Cotyledon
Plumule
Hilum
Micropyle
Radicle

Or


Cerebral hemisphere
Corpus callosum
Cerebrum
Thalamus
Hypothalamus
Cerebral aqueduct
Brain stem
Midbrain
Pons
Hindbrain
Cerebellum
Medulla
Spinal cord