

Please check that this question paper contains 27 questions and 4 printed pages.

**Class : XI
BIOLOGY**

Time Allowed : 3 Hours

Maximum Marks : 70

General Instructions :

1. All the questions are compulsory.
2. The question paper consists of four sections A, B, C and D.
3. Internal choice is given in all the sections. **A student has to attempt only one of the alternatives in such questions.**
4. Section-A contains 5 questions of 1 mark each.
5. Section-B has 7 questions of 2 marks each.
6. Section-C is of 12 questions of 3 marks each.
7. Section-D has 3 questions of 5 marks each.
8. Wherever necessary, the diagram drawn should be neat and properly labelled.
9. Fifteen minutes reading time has been allotted to read the question paper. Students will not write anything during this time.

SECTION - A

1. Name an organism which is photosynthetic, but when deprived of sunlight acts as a heterotroph. 1

OR

Name the most abundant protein present in the animal world.

2. Give the taxonomical genus and order of housefly. 1
3. Name the plant tissue that provides mechanical support to the growing parts of the plant, such as the petiole of a leaf. 1
4. Name the type of linkage by which the monomers in the following macromolecules are held together : 1
- (a) Polysaccharides
- (b) Polypeptides
5. Give a diagrammatic representation of the amino acid serine. 1

OR

Give a diagrammatic representation of the nucleoside adenosine.

SECTION - B

6. Describe the characteristic features of pachytene stage of prophase of Meiosis I. 2

OR

Write a note on the stage termed diakinesis of prophase of Meiosis I

7. Given below is a table showing the process of digestion in man. Fill in the blanks (a-d) with [correct] answers. 2

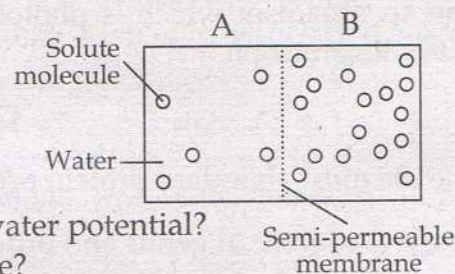
Enzyme	Site of action	Substrate	End Product/s of action
(a)	Stomach	Protein	Peptones / Proteoses
Lipase	Small intestine	Fat	(b)
(c)	Small intestine	Nucleic acid	Nucleotides and Nucleosides
Trypsin	The region of small intestine - (d)	Proteins, Peptones and Proteoses	Dipeptides

8. (a) Name two hormones which are commonly called catecholamines?
 (b) Give two effects caused by the release of the above hormones during emergency situations in our body. 2
9. "Double fertilisation is an event unique to the angiosperms". Explain. 2

OR

"Heterospory in some pteridophytes as *Salvinia* has an evolutionary significance." Explain.

10. Study the figure given below in which the two chambers A and B, containing solutions are separated by a semipermeable membrane. Answer the given following questions.



- (a) Solution of which chamber has a lower water potential?
 (b) In which direction will osmosis take place?
 (c) Solution of which chamber has a lower solute potential?
 (d) At equilibrium which chamber will have lower water potential? 2
11. (a) Draw citric acid cycle and specify the reaction catalysed by citrate synthase in Krebs' cycle.
 (b) A farmer has added *Azotobacter* culture to soil before sowing maize. Which mineral element is being replenished by adding the culture? 2
12. Differentiate between the following terms -
 (a) Ligases and Lyases
 (b) Deoxyribonucleic acid and Ribonucleic acid. 2

SECTION - C

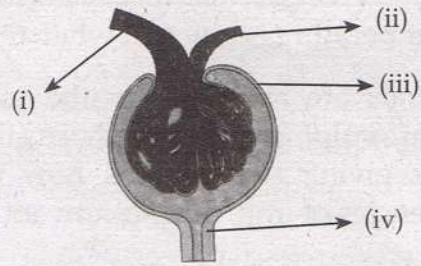
13. Name the phylum to which the following animals belong to. 3
- | | |
|--------------------------|------------------------|
| (a) <i>Pleurobrachia</i> | (b) <i>Ancylostoma</i> |
| (c) <i>Pila</i> | (d) <i>Petromyzon</i> |
| (e) <i>Physalia</i> | (f) <i>Limulus</i> |

14. Name and describe the type of root modifications observed in a banyan tree and Sugarcane. 3

OR

Name and describe the type of phyllotaxy observed in *Calotropis* and *Alstonia*.

15. (a) Observe the given diagram of Malpighian body and label the parts (i-iv). 3



- (b) Both pigeon and a cat were fed on a protein diet. In what major forms, would they excrete their nitrogenous wastes?
16. (a) Why do myofibrils of a skeletal muscle show striated appearance? Explain.
(b) Explain the role of calcium ions and ATP hydrolysis in muscle contraction. 3

OR

Write a note on anatomical structure of a scapula bone of the pectoral girdle.

17. (a) Justify giving reasons - 3
(i) GA_3 is applied to juvenile conifers.
(ii) A ripe fruit when mixed with unripe fruits hastens fruit ripening.
(b) Differentiate between arithmetic and geometrical growth rate.
18. (a) What is the significance of mitosis? Enlist any two points.
(b) State the important events taking place during S phase in an animal cell. 3
19. (a) Name the specific type of connective tissue associated with the storage of fats. Where is it located?
(b) Draw a well-labelled diagram of cardiac muscle tissue showing communication junctions and state their significance. 3

OR

Where are the following epithelial tissues found in an animal cell? Give one example of each and give their diagram.

- (a) Squamous epithelium
(b) Cuboidal epithelium
(c) Ciliated columnar epithelium
20. (a) Give the scientific term used for the type of chromosome having -
(i) Centromere in the middle forming two equal arms of the chromosomes.

- (ii) Centromere is situated close to the ends of the chromosome forming one extremely shorter arm and one very long arm.
- (b) What is a mesosome in a prokaryotic cell? State its any two functions.
- (c) SER is mainly involved in the synthesis of which biomolecule? 3
21. (a) How are prosthetic groups different from co-enzymes?
- (b) State the changes that take place during the action of an enzyme when the temperature is low and when the pH of the medium is optimum. 3
22. (a) "Minerals are absorbed by the plants in the form of ions". In which form are sulphur and phosphorus taken up by the plants?
- (b) Justify giving two reasons how excess of manganese in soil induce deficiencies of iron, magnesium and calcium. 3
23. (a) Define fermentation.
- (b) Explain and draw the symplastic pathway of movement of water in plants. 3

OR

T.W. Engelmann performed the experiment on the basis of which the first action spectrum of photosynthesis was described. Describe the experiment.

24. (a) Enlist the three layers of neural cells of retina from inside to outside.
- (b) Write any three functions controlled by limbic system in association with the hypothalamus. 3

SECTION - D

25. Describe briefly the anatomy of dicotyledonous leaf with the help of a labelled diagram. 5

OR

- (a) Draw a well-labelled diagram of female reproductive system of a cockroach.
- (b) How do the nymphs of cockroach differ from adult cockroach?
26. Describe the regulation of cardiac activity in man. 5

OR

Explain the mechanism of inspiration under normal conditions in man.

27. Describe the process of Non-cyclic Photo-phosphorylation. What is the specific location in the chloroplast where it takes place? 5

OR

Explain the mechanism of membrane-linked ATP synthesis during respiration in plants. In which form pyruvic acid is converted into before it enters the Krebs' cycle?