



General Instructions:-

1. There are a total of 27 questions and five sections in the question paper. All questions are compulsory.
2. Section **A** contains question numbers 1 to 5, multiple choice questions of one mark each.
Section **B** contains question numbers 6 to 12, short answer type I questions of two marks each.
Section **C** contains question numbers 13 to 21, short answer type II questions of three marks each.
Section **D** contains question number 22 to 24, case-based short answer type questions of three marks each.
Section **E** contains question numbers 25 to 27, long answer type questions of five marks each.
3. There is no overall choice in the question paper. However, internal choices are provided in one question of one mark, one question of two marks, two questions of three marks and all three questions of five marks. An examinee is to attempt any one of the questions out of the two given in the question paper with the same question number.
4. Wherever necessary, the diagrams drawn should be neat and properly labeled.

SECTION A

1. Cells of this tissue are living and shows angular wall thickening. They also provide mechanical support. The tissue is:
 - a) Xylem
 - b) Collenchyma
 - c) Sclerenchyma
 - d) Epidermis
2. Choose the correct option:

I. Diffusion of solvent.	A. Exocytosis
II. Intake of fluid material.	B. Active transport
III. Release of material from cell.	C. Phagocytosis
IV. Intake of solid particle.	D. Osmosis
V. Expenditures of energy.	E. Pinocytosis

 - a) I-D, II-E, III-A, IV-C, V-B.
 - b) I-E, II-D, III-A, IV-B, V-C.
 - c) I-B, II-C, III-D, IV-A, V-E
 - d) I-A, II-C, III-B, IV-E, V-D
- 3a) Sugars are technically called carbohydrates, referring to the fact that their formula are only multiple of C(H₂O). Hexoses therefore have six carbons, twelve hydrogen and six oxygen atoms. Glucose is a Hexose. Choose from another Hexose the following.
 - a) Fructose.
 - b) Erythrose.
 - c) Ribulose.
 - d) Xylulose

OR

- 3b). Identify the correct and incorrect match about respiratory volume and capacities.
Mark the correct answer
 - I. Inspiratory capacity (IC) = Tidal volume +Respiratory volume
 - II. Vital capacity (VC) = Inspiratory Reserve Volume(IRV) + Expiratory Reserve Volume (ERV) + Tidal volume(TV)
 - III. Residual Volume(RV) = Vital Capacity(VC) - Inspiratory Reserve Volume(IRV)

IV. Tidal volume (TV) = Inspiratory capacity(IC) +Inspiratory Reserve Volume(IRV)

- a) I. Incorrect, II. Incorrect, III. Incorrect, IV. Correct
- b) I. Incorrect, II. Correct, III. Incorrect, IV. Correct
- c) I. Correct, II. Incorrect, III. Incorrect, IV. Correct
- d) I. Incorrect, II. Correct, III. Correct, IV. Correct

4. The reaction that is responsible for the primary fixation of CO₂ is catalysed by:

- a) RuBP carboxylase.
- b) PEP carboxylase.
- c) PGA synthase
- d) RuBP carboxylase and PEP carboxylase.

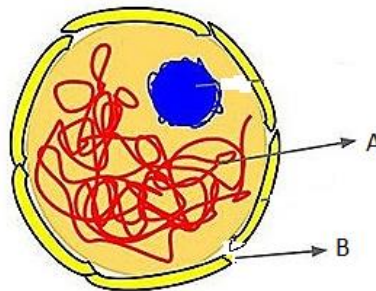
5. Which of the following are correctly stated as it happens in the cockroach?

- a) The food grounds by the mandible and gizzard
- b) Malpighian tubule is excretory organs projecting from the colon
- c) Oxygen is transported by haemoglobin in blood.
- d) Nitrogenous excretory product is urea.

SECTION B

6. 'Respiratory Quotient' depends upon substrate. Justify the above statement with the help of examples.

7. Label the parts marked 'A' and 'B'. Write their function.



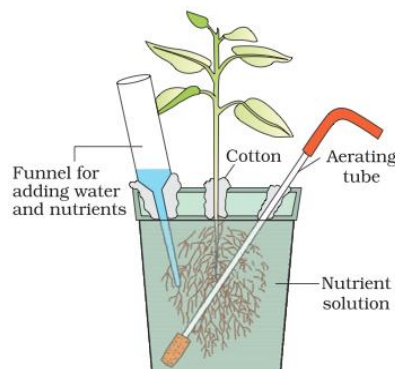
8. Write down the common features of connective tissue. On the basis of structure and function, differentiate between bones and cartilage.

OR

Scientific names are acceptable to biologists all over the world. State the universal rules of nomenclature.

9. Point out the differences in the anatomy of leaf of Peepal (*Ficus religiosa*) and maize (*Zea mays*). Draw the diagrams and label the differences.

10. Carefully observe the following figure and answer the question



- a) Name the technique shown in the figure and the scientist who demonstrated this technique for the first time.
 - b) What is the significance of aerating tube and feeding funnel in this setup?
11. Find out what do the terms 'Algal bloom' and 'Red tide' signify?
 12. When and where does reduction division take place in the life cycle of liver wort, moss, fern, gymnosperm and angiosperm?

SECTION C

13. Name one enzyme of gastric juice and one of pancreatic juice that are released as pro enzymes in the human alimentary canal. Give the substrate and the end products of each.
14. What is placentation? Name and Draw various types of placentation in the flower as seen in T.S or V.S.
15. What is a reflex? Explain the two categories of the reflexes with the help of one example for each. Draw a labelled sketch of reflex arc.

OR

Briefly explain the role of ear as an organ of hearing and balancing.

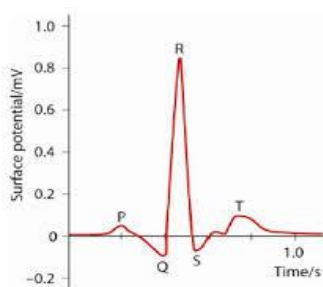
16. What is the intrinsic mechanism that provides auto regulation of glomerular filtrate? Explain.
17. Write a short note on the roles of diaphragm and rib cage in the process of respiration.
18. How are chromosomes classified based on the position of the centromere?
19. Given below are the distinctive features of organisms. Identify the phylum which has the following characteristics and mention the role played by it.
 - a) Flame cells
 - b) Water vascular system
 - c) Cnidoblasts.
20. a) Some varieties of wheat are known as spring wheat while others are winter wheat. Former variety is sown and planted in spring harvested by the end of the same season. However winter varieties, if planted in spring fail to flower or produce mature grains within a span of flowering season. Explain why?
 - b) What term is used for in the promotion of flowering under low temperature?
21. Define Uniport, Symport and Antiport. Do they require energy?

OR

- a) Plants that are adapted to dry tropical regions have a C_4 pathway. Give diagrammatic representation of the C_4 pathway.
- b) Differentiate between Oxidative decarboxylation and Oxidative phosphorylation.

SECTION D

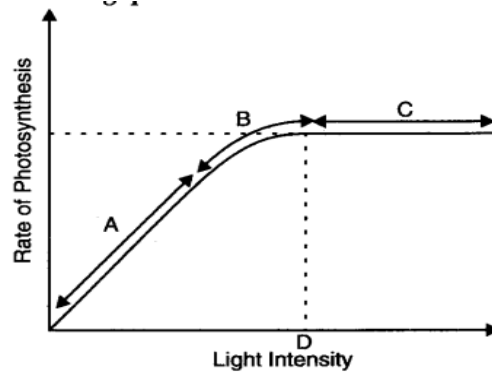
22. a) Given below is the diagrammatic representation of a standard ECG. Label its different peaks.



b) Given below are the abnormal conditions related to blood circulation. Name the disorder,

- i. Increased the systolic pressure.
- ii. Acute chest pain due to failure of oxygen supply to heart muscle.

23. Figure shows effect of light on the rate of photosynthesis. Based on the graph, answer the following questions.



- a) At which point/s (A, B or C) in the curve is light act as a limiting factor?
- b) What could be by limiting factor/s in region A.
- c) Why do C and D represent on the curve.

24. Study the given diagrams and answer the following questions.

Fig: A

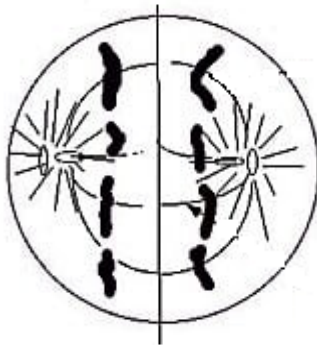
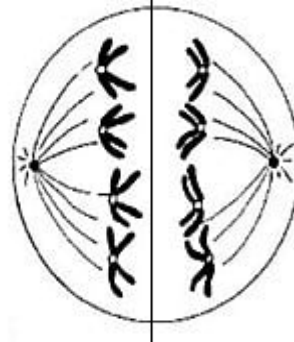


Fig: B



- a) Identify Figure A and B. Describe how Figure A differ from Figure B and explain how it affects the daughter cells.
- b) Name the stage of cell cycle which the crossing over of homologous chromosomes takes place chromosomes takes place.

SECTION E

25. a) When and where does anaerobic respiration of occur in man and yeast?
- b) Why is less energy produced during anaerobic respiration than in aerobic respiration?
- c) Where is the respiratory electron transport system located in a cell?
- d) Give the schematic representation of ETC.

OR

Explain the mechanism of action of hormones, taking insulin and estrogen as the examples.

26. Schematically represent primary secondary and tertiary structure of a hypothetical polymer, protein.

OR

a) Formation of enzymes substrate complex is the first step in catalysed reactions.

Describe the other step still the formation of product.

b) Write on different classes of enzymes.

c) How are co-factors different from prosthetic groups?

27. a) The membrane of resting nerve fibres is said to be in a polarised state. What do you mean by this statement?

b) Explain the process of transmission of nerve impulse through a synapse.

OR

a) Draw labeled diagram to show the ultra-structure of sarcomere.

b) Briefly explain the types of joints present in human skeleton.
