

2022
BIOLOGY
(Theory)

Full Marks : 70

Time : 3 hours

General Instructions :

This question paper consists of 5 (five) sections:

- (i) Section A consists of two parts A₁ and A₂.
 A₁ consists of 5 (five) questions (Q1 – Q5) which are multiple choice questions, of one mark each; should be answered together in one place.
 A₂ consists of 5 (five) questions (Q6 – Q10) of one mark each, to be answered in one word or one sentence.
- (ii) Section B consists of 7 (seven) questions (Q11 to Q17) of two marks; to be answered in approximately 20 – 30 words each.
- (iii) Section C consists of 9 (nine) questions (Q18 – Q26) of three marks each to be answered in 30 – 50 words each.
- (iv) Section D consists of 1 (one) question (Q27) of 4 marks, to be answered in approximately 70 – 100 words.
- (v) Section E consists of 3 (three) questions (Q28 to Q30) of 5 marks each, to be answered in approximately 80 – 120 words.

SECTION – A₁

Choose the correct answer :

1 × 5 = 5

1. To which of the following categories does adipose tissue belong? 1
 - (i) Epithelial
 - (ii) Connective
 - (iii) Muscular
 - (iv) Neural
2. The functions of heterocysts include 1
 - (i) Recycling nutrients
 - (ii) Nitrogen fixation
 - (iii) Help in photosynthesis
 - (iv) All the above.
3. Enzymes act as a catalyst in a reaction by 1
 - (i) Bringing down activation of energy
 - (ii) Changing the pH value
 - (iii) Changing the active site
 - (iv) Interfering with integral proteins.

(3)

4. Plasmolysis occurs when 1
- (i) Water enters into the cell
 - (ii) Water concentration is equal
 - (iii) Water moves out of the cell
 - (iv) None of the above.
5. Animals in which the cells are arranged in two embryonic layers are called 1
- (i) Monoblastic
 - (ii) Diploblastic
 - (iii) Triploblastic
 - (iv) Coelomate.

SECTION – A₂

(Very short answer) 1 × 5 = 5

6. What are parasites? 1
7. Define bilateral symmetry. 1
8. Write the floral formula of Solanaceae family. 1
9. Define osmoregulation. 1
10. What is Glomerulonephritis? 1

(4)

SECTION – B

(Short answer – I) 2 × 7 = 14

11. Either

Name the phylum to which Starfish and Sponge belong.

Or

1 + 1 = 2

What are the diagnostic characteristics of chordates? 2

12. Draw a labelled diagram of myelinated neurons. 2

13. Draw a labelled diagram of chloroplast. 2

14. What is the nature of cell walls in diatoms? 2

15. Define enzyme. Give one example. 1 + 1 = 2

16. What are trichomes? 2

17. Either

Write the functions of mitochondria. 2

Or

What is Respiratory quotient? Write the value of R.Q. for protein. 1 + 1 = 2

(5)

SECTION — C

(Short answer – II)

3 × 9 = 27

- 18.** *Either*
Explain the mechanism of breathing in humans. 3
Or
Differentiate between prokaryotic and eukaryotic cells. 3
- 19.** Briefly describe the different structures of protein. 3
- 20.** What are hormones? Name the different endocrine glands in human. 1 + 2 = 3
- 21.** Write the composition of mammalian blood. What are the main functions of different blood cells. $1\frac{1}{2} + 1\frac{1}{2} = 3$
- 22.** What do you understand by photoperiodism and vernalisation? $1\frac{1}{2} + 1\frac{1}{2} = 3$
- 23.** What are the steps involved in formation of a root nodule? 3
- 24.** What role does root pressure play in water movements in plants? 3

(6)

- 25.** What is chiasmata? What is the significance of meiosis?

1 + 2 = 3

- 26.** Briefly describe the simple epithelial tissues. 3

Or

- Describe the mechanism of digestion of carbohydrates. 3

SECTION – D

- 27.** Define oxygen dissociation curve. Discuss the factors affecting Oxygen dissociation curve. 1 + 3 = 4

SECTION – E

(Long answer type) 5 × 3 = 15

- 28.** *Either*
Describe the different types of vascular bundles in plants with the help of labelled diagrams. 3 + 2 = 5
Or
Name the five main groups of natural plant growth regulators. Write the physiological effects of any two of them. 1 + 2 + 2 = 5

(7)

29. *Either*

Mention the characteristics of phylum Mollusca. 5

Or

Draw a labelled diagram of human eye. Differentiate between rods and cones. $3 + 2 = 5$

30. *Either*

Describe the non-cyclic photophosphorylation in plants. 5

Or

Name the different types of muscles. With a labelled diagram, briefly describe the structure of skeletal muscle. $1 + 4 = 5$

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