2024

BIOLOGY

(Theory)

Full Marks: 70

Pass Marks: 21

Time: Three hours

All the questions are compulsory.

The figures in the right margin indicate full marks for the questions.

For Question Nos. 1 to 7 select the most appropriate one from the given alternatives A, B, C and D and rewrite the same.

1. A taxon can be defined as – 1

   A. A group of similar genera

   B. A group of similar species

   C. A group of similar order

   D. A group of any rank of organisms

2. Which one of the following is a true fruit? 1

   A. Apple

   B. Pear

   C. Cashew nut

   D. Coconut

3. Identify the non-granulocyte from the following – 1

A. Lymphocyte

B. Neutrophil

C. Basophil

D. Eosinophil

4. An essential amino acid is – 1

A. Serine

B. Tryptophan

C. Proline

D. Glycine

5. Photosynthetically active radiation is represented by the range of wavelength of – 1

A. 340-450 nm

B. 400-700 nm

C. 500-600 nm

D. 400-950 nm

6. Joint between bones of human skull is – 1

A. Hinge joint

B. Synovial joint

C. Cartilaginous joint

D. Fibrous joint

7. Erythroblastosis foetalis occurs in marriage between – 1

A. Rh^+ man and Rh^+ woman

B. Rh^+ man and Rh^- woman

C. Rh^- man and Rh^- woman

D. Rh^- man and Rh^+ woman

Question Nos. 8 to 17 are very short answer type questions carrying 1 mark each.

8. Define cytotaxonomy. 1

9. What is staminoide? 1

10. Why are mitochondria called semi-autonomous particles? 1

11. Define respiratory quotient. 1

12. Why is oxygen an ultimate acceptor of electrons in ETS? 1

13. In which photosystem you find O_2 evolving complex? 1

14. Name the fluid filled double membranous layer that surrounds the lungs of human beings. 1

15. What causes muscle fatigue? 1

16. Why is the axoplasm of a resting axon negatively charged? 1

17. "Vasopressin is also known as antidiuretic hormone". Comment. 1

Question Nos. 18 to 27 are short answer type-II questions carrying 2 marks each.

18. Distinguish between lizards and snakes by giving two points. 2

19. List two important functions of ground tissue system. 2

20. Why are the leaves of cactus plant modified into spines? Give two points. 2

21. Differentiate between male and female frogs in two points. 2

22. "Proteins have been called biological polymers". Analyse the statement by giving two points. 2

23. What are the main two steps in aerobic respiration? 2

24. Distinguish between photoperiodism and vernalisation by giving two points. 2

25. How does water stress decrease the rate of photosynthesis? 2

26. It is advisable to do nasal breathing rather than mouth breathing. Analyse 2

27. "Oxytocin is regarded as birth hormone". Justify. 2

Question Nos. 28 to 33 are short answer type-I questions carrying 3 marks each.

28. "Bryophytes are called amphibians of plant kingdom". Justify. 3

OR

"Angiosperms undergo double fertilisation". Analyse.

29. Cardiac muscles have special features. Comment. 3

OR

Blood is a connective tissue. Give reason.

30. How do proteins act as carrier proteins? Give three points. 3

OR

Differentiate between active and passive transport by giving three points.

31. "Cell membrane is dynamic". Justify the statement by giving three points. 3

OR

"Nature of enzyme action is best explained by lock and key hypothesis". Justify.

32. Distinguish between C_3 and C_4 plants by giving three points. 3

OR

Distinguish between short-day plants and long-day plants by giving three points.

33. Draw a neat diagram of the sectional view of human heart and label the following : 3

(i) Mitral valve

(ii) Superior vena cava

OR

Draw a neat diagram of the Human Urinary system and label the following :

(i) Dorsal aorta

(ii) Kidney

Question Nos. 34 to 36 are essay type questions carrying 5 marks each.

34. Differentiate between DNA and RNA by giving five points. 5

OR

Differentiate between meiosis I and meiosis II in an animal cell.

35. Explain the major steps of Krebs' cycle. Where does the process occur in a cell? 5

OR

Explain the necessary conditions for the occurrence of growth in plants.

36. "Pancreas acts both exocrine and endocrine glands". Analyse. 5

OR

The regulation of cardiac activity is under the control of nerves control and endocrine control. Analyse.
