Roll No. _____ **Code : 112011-044-A**

Please check that this question paper contains **30** questions and **4** printed pages.

CLASS-XI
BIOLOGY

Time Allowed : 3 Hrs. **Maximum Marks : 70**

General Instructions :

(i) All questions are compulsory.

(ii) There are 30 questions in total. Questions 1-8 carry one mark each, questions 9-18 carry two marks each, questions 19-27 carry three marks each and questions 28-30 carry 5 marks each.

(iii) There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of three marks, and all three questions of five marks each. You have to attempt only one of the choices in such questions.

(iv) 15 minutes time has been allotted to read this question paper. During this time, you read the question paper and will not write any answer on the answer sheet.

1. A plasmolysed cell can be deplasmolysed by placing it in a/an : (1)
   (a) Hypotonic solution (b) Hypertonic solution
   (c) Isotonic solution (d) Saturated solution

2. In fern, the prothallus develops from : (1)
   (a) Spore (b) Oospore
   (c) Elater (a) Antherozoid

3. An example of competitive inhibition of an enzyme is the inhibition of : (1)
   (a) Cytochrome oxidase by cyanides
   (b) Hexokinase by glucose-6-phosphate
   (c) Carbonic anhydrase by carbon dioxide
   (d) Succinic dehydrogenase by malonic acid

4. Which one of the following is a hermaphrodite animal ? (1)
   (a) Cockroach (b) Earthworm
   (c) Frog (d) Termite

5. Eustachian tube is present between : (1)
   (a) inner ear and larynx (b) middle ear and pharynx
   (c) outer ear and pharynx (d) middle ear and larynx

6. What is vernalisation ? (1)

7. What is a living fossil ? Give one example. (1)

8. Name the enzyme secreted by cells of juxtaglomerular apparatus. Write its function. (1)

9. During which stage of the cell division do the following events occur? (½×4=2)
   (i) Chromosomes move towards the spindle equator.
   (ii) Centromeres split and chromatids separate.
   (iii) Pairing of homologous chromosomes takes place.
   (iv) Crossing over between non-sister chromatids takes place.

10. Describe the nature of bonds present in polysaccharides and polynucleotides. Also write their names. (1+1=2)

11. Name the respective mineral nutrient of plants that: (½×4=2)
   (i) is a constituent of the ring structure of chlorophyll.
   (ii) is needed in the synthesis of auxins.
   (iii) forms the component of nitrogen and nitrate reductase.
   (iv) is a constituent of ferredoxin.

12. Give two similarities between a mitochondrion and a bacterium. (1+1)

OR

What is middle lamella ? Give its chemical nature and function. (2)

13. List the four major groups of Protozoa. Give one characteristic feature and one example of each group. (½×4=2)

14. What is the role of carbonic anhydrase ? Where does it operate ? (1+1=2)

15. Where are the following present in the human heart ? (½×4=2)
   (i) SAN (ii) Mitral valve
   (iii) Chordae tendinae (iv) Bundle of HIS

16. During the formation of urine in humans about 99% of the filtrate is reabsorbed by the different segments of the nephron. Write the role of PCT and Henle's loop in selective reabsorption. (1+1=2)

17. How many vertebrae are present in the vertebral column of man ? Give the vertebral formula. (1+1=2)

18. Write a short note on the functions of insulin and glucagon. (1+1=2)

19. Name the three physical properties of water on which the ascent of xylem sap depends. How do these properties help the ascent of sap ? (2+1=3)

20. List the crucial events in aerobic respiration. Where do these processes take place in mitochondria ? What is the fate of the end product of the first event ?(1+1+1=3)

21. Briefly explain Differentiation, Dedifferentiation and Redifferentiation. (1+1+1=3)

22. Describe the following (i) synapsis (ii) bivalent and (iii) chiasmata. (1×3=3)

23. Explain briefly the following terms : (½×6=3)

(i) Protonema (ii) Antheridium

(iii) Archegonium (iv) Diplontic

(v) Sporophyll (vi) Isogamy

OR

Explain briefly the following terms :

(i) Pseudocoelom (ii) Metamerism

(iii) Bioluminescence (iv) Dioecious

(v) Water vascular system (vi) Cloaca

24. Describe briefly the circulatory system of earthworm. (3)

25. The cross-section of a plant material shows the following anatomical features under the microscope :

(a) Vascular bundles are radially arranged (1)

(b) Four xylem strands with exarch condition of the protoxylem

(i) To which organ should it be assigned ? (1)

(ii) What are lenticels ? Where do they occur and what is their function ? (½+½=1)

26. Name one enzyme of the gastric juice and one pancreatic juice that are released as proenzymes in the human alimentary canal. Give the substrate and products of each. (1+1+1=3)

27. Distinguish between :

(i) Dendrites and axons (ii) Cerebrum and cerebellum

(iii) Blind spot and yellow spot (1+1+1=3)

28. Where does Calvin cycle take place in the chloroplast ? Explain the three stages of this cycle. How many ATP and NADH molecules will be required to make one molecule of glucose ? (1+3+1)

OR

What is ETS ? Where is it present ? How is ATP synthesised in the mitochondria ? (½+½+4=5)

29. (i) Give the cytological terms for the following : (½×4=2)

(a) ribosomal studded components of ER

(b) structural and functional units of plastids

(c) knob-like particles present in the inner mitochondrial membrane

(d) chromosomes with subterminal membrane

(ii) Name the organelles which

(a) are site for active ribosomal RNA synthesis

(b) exhibit an array of 9+2 fibrillar arrangement

(c) are rich in all types of hydrolytic enzymes

(d) have cisternae arranged near the nucleus with distinct cis and trans face

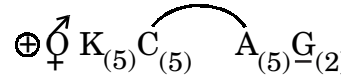
(e) are not surrounded by any membrane

(f) are bound by double membranes (½×6=3)

OR

Briefly describe the different types of proteins on the basis of their shape and chemical structure. (5)

30. (i) Carefully observe the following floral formula and answer the questions that follow :



(a) Identify the flower and name its family. (½+½=1)

(b) Comment on the type of aestivation (sepals and petals), androecium and placentation. (½×4=2)

(ii) What is meant by modification of root ? What type of modification of root is found in (a) banyan tree (b) turnip, and (c) mangrove plant ? (½×4=2)

OR

(i) Draw a labelled diagram of the alimentary canal of cockroach. (3)

(ii) Distinguish between :

(a) simple and compound epithelium

(b) cardiac muscle and striated muscle. (1+1=2)