

*Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate the full marks.*

Use separate answer sheets for Section I and Section II.

**Section I (Botany)**

**Group A**

**Rewrite the correct option of each question in your answer sheet.**

5×1=5

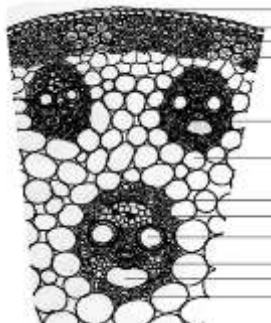
- Central dogma is represented by:
  - DNA—RNA—proteins
  - DNA—DNA—proteins
  - RNA—DNA—proteins
  - DNA—proteins—RNA
- Longest RNA is:
  - r-RNA
  - t-RNA
  - m-RNA
  - g-RNA
- In Calvin cycle, one molecule of glucose is formed from:
  - $6\text{CO}_2 + 30\text{ATP} + 12\text{NADPH}$
  - $6\text{CO}_2 + 12\text{ATP}$
  - $6\text{CO}_2 + 18\text{ATP} + 12\text{NADPH}$
  - $6\text{CO}_2 + 18\text{ATP} + 30\text{NADPH}$
- Xylem is endarch in:
  - Monocot root
  - Dicot root
  - Dicot stem
  - Monocot stem
- Which of the following is not a growth inhibitor?
  - IAA
  - Dormin
  - Abscisic acid
  - Ethylene

**Group B**

**Give short answer to the following question :**

4×4 =16

- Identify the diagram given below. Verify your identification. (1+3)



- Define osmosis. Describe a simple experiment to demonstrate the process of osmosis. (1+3)

**OR**

What does it mean by genetic code? Describe synonymous, initiation and nonsense codons with examples. (1+3)

- Define genetic material. Draw a well labeled diagram of helically coiled structure of genetic material. (1+3)
- Name any two plants used as green manure. What are the advantages of green manure over chemical fertilizers? (1+3)

**Group C**

**Give long answer to the following questions.**

2×8=16

- Mention the types of RNA with their specific role in the process of protein synthesis. Describe the structure of smallest RNA with well labeled diagram. (3+3+2)
- What is photolysis of water? Describe the light dependent reaction of photosynthesis with diagrammatic representation. (1+4+3)

**OR**

Name the phenomenon for upward movement of water in plant tissue. Describe this mechanism to explain how it is related with transpiration. (1+7)

**Section II (Zoology)**

**Group: A**

**Rewrite the correct option of each question in your answer sheet.**

(6×1=6)

- Muscular fold which connects tongue to lower jaw is:
  - Soft palate
  - Sulcus terminalis
  - Frenulum
  - Uvula
- Mark the true statement among the following with reference to normal breathing:
  - Inspiration is a passive process whereas expiration is active
  - Inspiration is an active process whereas expiration is passive
  - Inspiration and expiration are active processes
  - Inspiration and expiration are passive processes
- Which artery supplies blood to diaphragm?
  - Coronary
  - Pulmonary
  - Sub clavian
  - Phrenic
- Which of the following is less developed ventricle in human brain?
  - Rhinocoel
  - Diocoel
  - Schizocoel
  - Metacoel
- Which blood group is universal donar?
  - O
  - A-ve
  - O+ve
  - O-ve

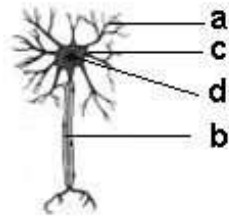
17. All mammals are:

- a. Ammonotelic    b. Uricotelic    c. Ureotelic    d. Ureotelism

**Group B**

**Give short answer to the following question: (4×4=16)**

18. Identify the given figure. Label a, b, c and d. Write the difference between a and d. (1+1+2)



19. On what basis connective tissue is classified? Differentiate between tendons and ligaments. (1+3)
20. Describe the process of carbon dioxide transport in human body. Which compound is formed during carbon monoxide poisoning? (3+1)
21. Define blood pressure. Differentiate between systolic blood pressure and diastolic blood pressure. Name the instrument by which blood pressure is measured. (1+2+1)

**OR**

Which structure forms the posterior part of central nervous system? Explain its structure and function. How is spinal cord protected? (1+2+1)

**Group C**

**Give long answer to the following questions. (2×8=16)**

22. The action of enzymes is to convert complex food into simple food. Discuss the enzymatic action of digestive juice on food in different parts of human alimentary canal. Name any two enzymes which help in the digestion of disaccharides. (7+1)
23. Give the position of human kidneys. Describe the internal and microscopic structure of human kidney with necessary diagrams. (1+3+4)

**OR**

What is meant by double circulation? Explain it with diagram showing direction of the course of blood circulation in human heart. (1+3+4)

**The End**

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**Section I (Botany)**

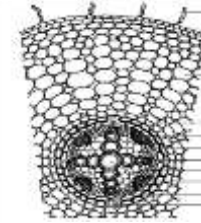
**Group A**

**Rewrite the correct option of each question in your answer sheets. (5×1=5)**

- The length of DNA in which mutation takes place is called:
  - Muton
  - Recon
  - Cistron
  - Central dogma
- Unwinding of complementary strands takes place in presence of enzymes:
  - Helicase and topoisomerase
  - DNA polymerase
  - DNA ligase
  - Primase
- Which one explains ascent of sap?
  - Malate hypothesis
  - Mass flow
  - Cohesion theory
  - Internal theory hypothesis
- In which artificial propagation method stock and scion are involved?
  - Culture
  - Cutting
  - Layering
  - Grafting
- Which of the following plant is most commonly used as green manure?
  - Sesbania aculeate*
  - Shorea robusta*
  - Ficus benghalensis*
  - Oryza sativa*

**Group B**

**Give short answer to the following questions. 4×4 = 16**  
 6. Identify the diagram given below. Describe its stellar region. (1+3)



7. Define plasmolysis. Explain in brief about endosmosis and exosmosis with necessary diagrams. (1+3)

**OR**

- What is layering? Mention the advantages and disadvantages of vegetative propagation. (1+3)
8. “DNA is considered as genetic material”, why? Point out the differences between DNA and RNA. (1+3)
9. What is bolting? Describe the physiological effect of gibberellins on plants. (1+3)

**Group C**

**Give long answer to the following questions. 2×8=16**

10. Two new DNA molecules are formed, both of them possess one of the mother strands. What is the process called? Define it. Describe the process of initiation and elongation of new strands with well labeled diagrams. (1+1+6)
11. Name the first stable product of C3 cycle. Describe the dark reaction of photosynthesis with diagrammatic representation. (1+4+3)

**OR**

Write down the structure and function of stomata. Describe various internal and external factors that affect the rate of transpiration. (3+2+1.5+1.5)

**Section II (Zoology)**

**Group A**

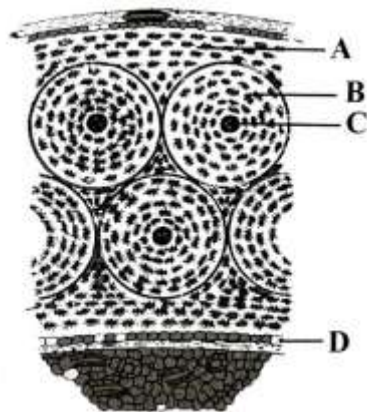
**Rewrite the correct option of each question in your answer sheet. (6×1=6)**

12. Which one is the characteristic of epithelial tissue?
- Tissue are highly vascularized
  - These cells never produce glands
  - There is the presence of large intracellular spaces
  - The cells will have a rapid rate of cell division

13. Starch digesting enzyme is:  
 a. Lipase      b. Maltase      c. Amylase      d. Erepsin
14. Which of the following duct carry salivary secretion from Parotid gland?  
 a. Stenson's duct      b. Whartson's duct  
 c. Duct of Rivinus      d. Cystic duct
15. The organisms which excrete uric acids as principal waste products are called:  
 a. Ureotelic      b. Ammonotelic      c. Uricotelic      d. Uricotelism
16. What body structure protects the lungs from outside harm?  
 a. Cartilage      b. Tiny sacs      c. The rib cage      d. Diaphragm
17. The heart of a healthy person beats normally per minute:  
 a. 60 times      b. 65 times      c. 72 times      d. 90 times

### Group B

- Give short answer to the following questions:** (4×4=16)
18. What do you mean by heterocrine gland? Why is pancreas referred to as mixed gland? Justify it with suitable explanation. (1+1+2)
19. Study the diagram of T.S. of bone and answer the following questions. (1+2+1)



- a. Label A, B, C and D.  
 b. Mention any two differences between C and D.  
 c. Write the function of B.
20. Draw a well labeled diagram of L.S. of human kidney. What is the function of hilus? (3+1)
21. Differentiate between two processes which help in food digestion.  
 Write about the absorption of fats. (2+2)

### OR

What is meant by portal system? Define hepatic portal system. Write its significance. (1+1+2)

### Group C

- Give long answer to the following questions.** (2×8=16)
22. Define pulmonary ventilation. Explain the mechanism of respiration with necessary diagrams. What do you mean by Residual Volume (RV)? (1+4+2+1)
23. What is meant by myogenic heart? Draw a well labeled diagram of internal structure of human heart. Explain its working mechanism (1+3+4)

### OR

Brain is a master organ which controls and co-ordinates different functions of our body. Describe the structure and function of different components of human brain. Write any two functions of cerebrospinal fluid. (4+3+1)

**The End**