Instructions:
i) Draw diagrams wherever necessary.
ii) Unlabelled diagrams do not get any marks.

PART I — (BOTANY)

SECTION – A
Answer the following questions in one word or in one sentence each:

1. Define transcription.
2. Name the tissue found in hard and stony shells of fruits.
3. What is Symplast pathway?
4. Name any one plant showing Kranz anatomy.
5. Why does a spray of gibberellin induce genetically dwarf plant to grow tall?

SECTION – B
Answer any five of the following questions in 2 to 5 sentences each:

6. Draw and label mRNA of eukaryotes.
7. Name any four advantages of tissue culture.
8. Mention four differences between heart wood and sap wood.
9. Explain ringing experiment to show that phloem is the path of translocation of solutes.
10. Explain the structure of stomatal apparatus.
11. Draw and label the Sigmoid growth curve.

| Turn over |
SECTION – C

Answer any four of the following questions in about 200 to 250 words each wherever applicable: \[4 \times 5 = 20\]

12. Describe the double helix model of DNA with a labelled diagram.

13. Explain the synthesis of insulin through recombinant DNA technology with a diagram.

14. What are monoclonal antibodies? Explain their production through Hybridoma technology.

15. Explain intra-stellar secondary growth in a dicot stem with a diagram.

16. Explain the transpiration pull theory of ascent of sap.

17. Explain the steps in Krebs cycle.

SECTION – D

I. Answer any one of the following: \[1 \times 5 = 5\]

18. a) Explain photolysis of water.

   b) Write notes on Blackman’s law of limiting factors.

   c) What is Emerson’s effect?

19. Give reasons for the following: \[5 \times 1 = 5\]

   a) UAA is a nonsense codon.

   b) S-strain of Streptococcus pneumoniae used in Avery’s experiment is pathogenic.

   c) Mostly germinating seeds are used in experiments of respiration.

   d) Application of auxins prevents pre-mature fall of fruits.

   e) Growth rate is slow during Lag-phase.

   (Questions only from the Practical Syllabus)

II. Answer any one of the following: \[1 \times 5 = 5\]

20. With a neat labelled diagram, explain the internal structure of monocot leaf.
21. a) Draw and label a neat diagram of potato osmoscope experiment.
   b) In which experiment do we use Whatman’s filter paper?
   c) What is the role of KOH in Ganong’s respiroscope experiment?

PART II — (ZOOLOGY)

SECTION - E

Answer the following questions in one word or one sentence each:

22. What is the genotype of AB group?
23. What is species diversity?
24. Define glycogenesis.
25. What is cyanosis?
26. What is meant by oligospermia?

SECTION - F

Answer any five of the following questions in about 2 to 5 sentences each:

27. Define test cross. What is its significance?
28. What are in situ and ex situ conservations?
29. Mention the causes and symptoms of Rhinitis.
30. Narrate the consequences of ozone layer depletion.
31. What are narcotic drugs? Give two examples.
32. Mention two permanent methods of sterilization.

SECTION - G

Answer any four of the following questions in about 200 to 250 words each wherever applicable:

33. Define criss-cross inheritance. Explain with reference to red-green colour blindness.
34. a) What is TEK?
   b) Explain any two methods of forest conservation.
   c) Name any one National Park of Karnataka.

| Turn over |
35. Explain the process of digestion with the help of pancreatic juice.
36. Give an account of steps involved in urine formation.
37. Explain the human respiratory system with the help of a neat labelled diagram.
38. a) Briefly explain clotting of blood as per Best and Taylor theory.
    b) Draw and label the structure of antibody.
    c) Mention the role of ADH.

SECTION – H

I. Answer any one of the following:  
   1 × 5 = 5

39. a) Draw and label a typical sperm.
    b) What are STD's? Give two examples.
    c) What is IVF technique?

40. Give reasons for the following:  
   5 × 1 = 5

   a) The blood of A group person cannot be given to a person of B group.
   b) The release of gases like \( \text{SO}_2 \) and \( \text{SO}_3 \) should be controlled.
   c) Generally lung cancer patients are heavy smokers.
   d) Human heart is myogenic.
   e) The sperms are attracted to move towards the egg.

(Questions only from the Practical Syllabus)

II. Answer any one of the following:  
   1 × 5 = 5

41. Explain the histology of liver with a neat labelled diagram.
42. a) Draw and label Haversian system of bone tissue.
    b) Explain the structure of blastula of frog.
    c) Name the reagent used to detect glucose in a given sample.