General instructions:
1. All questions are compulsory.
2. The question paper consists of four sections A, B, C, and D. Section A contains 8 questions of 1 mark each. Section B contains 10 Questions of 2 marks each, Section C has 9 questions of 3 marks where as Section D contains 3 questions of five marks each.
3. There is no overall choice. However, an internal choice has been provided in one question of two marks, one question of 3 marks and all questions of five marks weightage. A student has to attempt only one of the alternatives in such questions.

Section A
1. Expand ICBN
2. Which stage of cell division you will select to study the morphology of chromosome and why?
3. Umesh accidentally found an old preserved permanent slide with out a label. In his effort to identify it, he placed the slide under a microscope and observed the following features :-
   (a) Unicellular
   (b) Well defined nucleus
   (c) Biflagellate – one flagellum lying longitudinally and the other transversely.
   What would you identify it as? Name the kingdom to which it belongs.
4. Name the class of fish whose fertilization is internal.
5. Which tissue is present in the petiole of a leaf and what causes hardness in the pulp of certain fruits such as pear?
6. Provide a term to radially symmetrical flowers
7. Calculate the RQ when carbohydrates are used as a substrate.
8. Study the given graph and label A, and B

![Graph showing absorption vs wavelength in nm]

Section-B

9. Name the source of enterokinase. Mention its action.

10. Shown below is the floral diagram of a family. Identify the family and write the floral formula. Give an example of a plant belonging to this family.

![Floral Diagram]

11. Study the given table carefully and fill in the blanks a, b, c, d

<table>
<thead>
<tr>
<th>S.No</th>
<th>Phylum</th>
<th>Excretory Organ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Platyhelminthes</td>
<td>(a)</td>
</tr>
<tr>
<td>2.</td>
<td>(b)</td>
<td>Nephridia</td>
</tr>
<tr>
<td>3.</td>
<td>Mollusca</td>
<td>(c)</td>
</tr>
<tr>
<td>4.</td>
<td>(d)</td>
<td>Antennary Gland</td>
</tr>
</tbody>
</table>

[2]
12. Identify the type of placentation in a, b, c, and d
   
   a   b   c   d

13. What is meant by vital capacity and total lung capacity?  
14. How are viroids different from viruses?  
15. Where exactly does electron transport system operate in mitochondria? What is the role of oxygen? How many molecules of ATP are produced when one molecule of NADH goes through this path?  

   OR

   What is the end product of glycolysis in aerobes and where does this process occur?  
   What is the role of enzyme Hexokinase during this process?  

16. Distinguish between yellow spot and blind spot.  
17. An Rh-negative mother has safely delivered her first Rh-positive child. Discuss the problems that can arise as a result of subsequent pregnancy. What effect will it have?  
18. Draw neat diagram representing transverse section of human gut labeling its four basic layers.  

Section-C

19. Name three types of cell junctions found in epithelium and other tissues and mention one function of each of them.  
20. Draw a neat and labeled diagram depicting the model of fluid mosaic of plasma membrane.  
21. Answer the following with reference to the anatomy of monocot stem.  
   (a) How are the vascular bundles arranged?  
   (b) How are the xylem vessels arranged in each bundle?  
   (c) What do you call such an arrangement xylem vessels?  
   (d) Vascular bundles are closed. What type of tissue is lacking in them?  

   OR

Biology/XI

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[P.T.O.]
Answer the following with reference to the anatomy of the Dicot stem

(a) How are the vascular bundles arranged?
(b) How are the xylem vessels arranged in each bundle?
(c) What do you call such an arrangement of xylem vessels?
(d) Vascular bundles are open. What type of tissue is present in them?

22. (a) Explain when and how the two sounds of heart are produced?
    (b) Why is the S.A. node called pace maker of the heart?

23. (i) What would happen if: -
    (a) A rotten fruit gets accidentally mixed with unripe fruits.
    (b) GA3 is applied to rice seedling.
(ii) Why is ABA termed as a stress hormone?

24. Fill in the space /blank left in the given table to bring out the differences between C₃ and C₄ plants:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Characteristics</th>
<th>C₃ Plants</th>
<th>C₄ Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cell Type</td>
<td>One Type (mesophyll)</td>
<td>(a)</td>
</tr>
<tr>
<td>2</td>
<td>CO₂ acceptor</td>
<td>(b)</td>
<td>Phosphene / Pherate</td>
</tr>
<tr>
<td>3</td>
<td>First CO₂ fixation product</td>
<td>3PGA</td>
<td>(c)</td>
</tr>
<tr>
<td>4</td>
<td>Optimum Temperature Range</td>
<td>(d)</td>
<td>30°C–40°C</td>
</tr>
<tr>
<td>5</td>
<td>Mention whether Kranz anatomy is present or absent</td>
<td>(e)</td>
<td>(e)</td>
</tr>
<tr>
<td>6</td>
<td>Mention whether photorespiratory losses occur or not</td>
<td>(f)</td>
<td>(f)</td>
</tr>
</tbody>
</table>

25. Which mineral element is involved in the following?
(a) Opening and closing of stomata
(b) Cell elongation and differentiation
(c) Splitting of water to liberate oxygen
(d) Synthesis of auxin

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(e) Activation of enzymes involved in nitrogen metabolism
(f) Maintenance of ribosome structure.

26. (a) Give two functions of mesosome in Prokaryotic cell
(b) What is Polysome?
(c) Name two components that mitochondria possess which enable it to synthesize proteins.

27. (a) Why Malonate is called a competitive inhibitor of succinate?
(b) Name two Aminoacids that contain Sulphur.
(c) In a protein what is the name given to the first aminoacid and the last aminoacid?

Section-D

28. (a) Describe how root nodules are formed in soyabean plants.
(b) Name the biochemical components that the nodule contain.

OR

(a) What is meant by photoperiodism? Explain the different types of plants in nature with respect to this.
(b) It is been hypothesized that there is a hormonal substance(s) that is responsible for flowering. Where is it found and how does it work?

29. Observe the given diagram and answer the questions that follow:
(i) Label the parts A and B.
(ii) Give the function of C and D.
(iii) Name the layers which wrap this organ.
(iv) What is the limbic system?

OR

Biology/XI [ 5 ] [P.T.O.]
29. (A) How does the renin angiotensin mechanism lead to increase in blood pressure and GFR?
(B) Name and explain the mechanism that checks on the renin-angiotensin mechanism.

30. (a) Name and describe the events taking place during the interphase.
(b) How does cytokinesis in plant cell differ from that in animal cell?

OR

30. (a) Give two points of differences between primary and secondary metabolites.
(b) Why can starch hold iodine while cellulose cannot?
(c) Draw the structure of amino acid alanine.
(d) Give four features of DNA.