

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, April 2023
First Degree Programme under CBCSS
Botany
Core Course IX
BO 1641 — PLANT PHYSIOLOGY AND BIOCHEMISTRY
(2014 – 2018 Admission)

Time : 3 Hours

Max. Marks : 80

- I. Answer **all** questions in **one** or **two** sentences. All questions are **compulsory**.
1. What are antitranspirants? Cite one example.
 2. Differentiate between hydroponics and aeroponics.
 3. When the RQ of a respiring tissue was measured the value obtained was one? What could be the most probable respiratory substrate used by the tissue?
 4. Name the plant tissue through which the photosynthetic products are transported.
 5. Define vernalization.
 6. State the major difference between nastic and tropic movements.
 7. Which are the monosaccharide components of :
 - (a) sucrose and
 - (b) maltose.

8. What are glycolipids?
9. What are isoenzymes?
10. Describe the terms :
 - (a) apoenzyme and
 - (b) prosthetic group.

(10 × 1 = 10 Marks)

II. Answer any **eight** of the following.

11. What is allosteric inhibition of enzymes?
12. Differentiate between saturated and unsaturated fatty acids. Cite one example each for the two classes.
13. Illustrate the formation of peptide bond.
14. Write the structural formula of :
 - (a) glucose and
 - (b) fructose. How they differ in their functional groups?
15. Explain circadian rhythm using a suitable example.
16. What are the factors affecting photosynthesis?
17. What is phytochrome? Write a note on its importance in plant life.
18. Differentiate between nitrification and denitrification.
19. Write down the 'lysis' reaction in glycolysis.
20. Which are the cell organelles involved in photorespiration?
21. Define plasmolysis.
22. Dark reactions' of photosynthesis cannot proceed without 'light reactions'. Why?

(8 × 2 = 16 Marks)

III. Answer any **six** of the following.

23. Define osmosis. Enumerate the importance of osmosis in the life of a plant.
24. What are hydathodes? With the help of a labeled diagram explain the structure of a hydathode.
25. What are macronutrients? List out the major symptoms exhibited by plants when they are subjected to an inadequate supply of nitrogen.
26. Differentiate between cyclic and non-cyclic photophosphorylation.
27. On the basis of Cohesion-tension theory explain ascent of sap.
28. Cite one example each of natural and synthetic auxins. Elaborate on the practical applications of auxins.
29. With the help of an example explain transamination.
30. With the help of an example describe competitive inhibition of enzymes.
31. Explain the major steps involved in the beta oxidation of fatty acids.

(6 × 4 = 24 Marks)

IV. Write essays on any **two** of the following.

32. 'Starch and cellulose are polymers of glucose but they differ entirely in their structure and properties'. Justify the statement.
33. Oxidation of carbohydrates through the glycolysis and Krebs' cycle produces several reduced intermediates such as NADH_2 and FADH_2 . Explain the mechanism by which these compounds are oxidized.
34. Explain the mechanisms by which C_4 plants reduced the rate of photorespiration in their photosynthetic organs.
35. With the help of a labeled diagram explain the structure of a typical stomata. Explain how the structure of the guard cell wall helps in stomatal opening and closing. Add a note on the different theories explaining stomatal movement.

(2 × 15 = 30 Marks)