

2021

BOTANY
[HONOURS]
Paper : IX

Full Marks : 75

Time : 4 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.***GROUP-A****(Plant Physiology)****(Marks : 40)**

1. Answer any **five** questions: 2×5=10
- Define diffusion pressure deficit.
 - What is chlorosis? Which nutrient deficiency causes it?
 - Define transpiration. Name two anti-transpirants.
 - Define scarification.
 - Differentiate between innate and induced dormancy.
 - What do you mean long day neutral plants? Cite an example.

- What is Richmond and Lang effect?
 - What do you mean by "Triple Response"?
2. Answer any **two** questions: 5×2=10
- Describe briefly the cohesion-tension theory related to ascent of sap in plants. 5
 - Define guttation. Write down the significance of transpiration in plants. 1+4
 - Write a short note on the physiological effects of auxin. 5
 - Discuss the physiological and biochemical changes that occur during fruit ripening. 5
3. Answer any **two** questions: 10×2=20
- Write down the role of phosphorus and calcium in plants. 5
 - Explain the mechanism of phloem loading via symplastic pathway. 5
 - Elucidate the mechanism of stomatal movement in plants based on H⁺-K⁺ exchange pump hypothesis. Why transpiration is considered as "necessary evil"? 8+2
 - Explain the role and mode of action of abscisic acid (ABA) in plants in response to drought and low temperature stress. Name a gaseous hormone. 9+1

GROUP-B

(Plant Metabolism and Biochemistry)

(Marks : 35)

4. Answer any **two** questions: $2\frac{1}{2} \times 2 = 5$
- a) What is Reducing sugar? Why sucrose is not a reducing sugar?
 - b) What is meant by competitive inhibition of enzyme? Give an example.
 - c) What is the full form of RUBISCO? Write its dual roles.
5. Answer any **two** questions: $5 \times 2 = 10$
- a) Give an overview on Crassulacean acid metabolism. 5
 - b) Differentiate between photosystem I and photosystem II. Briefly explain the phenomenon of cyclic photophosphorylation. 2+3
 - c) Define β -oxidation. Provide a schematic representation of the process highlighting the enzymes involved. 1+4
6. Answer any **two** questions: $10 \times 2 = 20$
- a) Define cofactors and coenzymes with examples. Give an outline of classification of

enzymes with suitable examples. Mention any two industrial aspects of enzymes. 2+6+2

- b) Discuss the different steps of glycolysis. What is the net energy yield per molecule of glucose? 9+1
 - c) Describe the biochemistry of nitrogen fixation with special reference to the role of nitrogenase enzyme. Distinguish between secondary and tertiary structure of Proteins. 8+2
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