

Use Separate Answer
Script for each Group

M. Sc. Examination, 2018
Semester – II
Botany
Paper : MBC-22
(Plant Physiology & Biochemistry)

Time: Three Hours

Full Marks: 48

Questions are of value as indicated in the margin

Group-A (Plant Physiology)

Answer *any three* questions

1. Explain why: 2x4=8
 - (a) Root pressure is not revealed under highly transpiring condition.
 - (b) Sucrose accumulates in sieve elements against concentration gradient.
 - (c) Dark period is more important for time count during photoperiodic control of flowering.
 - (d) ABA is essential for seed development in spite of being an inhibitor of seed germination.
2. Why is bulk flow important for long distance transport in plants? Explain with reasons the pattern of water movement through root tissues. What is cavitation and how is it overcome by plants? 2+4+2=8
3. Discuss critically how antenna pigments funnel energy to the reaction centre. What evidences did lead to the existence of two photosystems during electron transport in thylakoids? State the role of Mn ions in oxygen evolving complex attached to PS II. 3+3+2=8
4. Describe the steps of ethylene biosynthesis from its precursor methionine. Explain how ethylene is synthesized in huge amount under stress in spite of limited reduced sulfur available for methionine. How does antisense RNA technology help to achieve controlled fruit ripening? 3+3+2=8
5. Distinguish between senescence and aging. What are different patterns of senescence found in plants? Discuss biochemically chlorophyll and protein metabolism induced by senescence in leaves. 2+2+4=8

Group-B (Biochemistry)

Answer *any three* questions

1. What is isoelectric focusing? How are proteins separated on the basis of isoelectric focusing? What is standard free energy change (ΔG°)? How does it differ from actual free energy change? What is entropy? What is the relation between free energy change (ΔG), enthalpy change (ΔH), change in entropy (ΔS) and absolute temperature (T)? 1+2+1+2+1+1=8
2. Mention the fates of pyruvate under aerobic and anaerobic conditions. Diagrammatically describe the five consecutive steps catalyzed by pyruvate dehydrogenase (PDH) complex leading to formation of CO₂ and acetyl CoA. Briefly describe the regulation of glycolysis. 2+3+3=8

P.T.O.

(2)

3. Write down the different steps of non-oxidative phase of pentose phosphate pathway. What is the importance of pentose phosphate pathway? Write down the different steps of transdeamination. 3+2+3=8
 4. Distinguish between substrate level phosphorylation and oxidative phosphorylation. Describe with diagram the electron flow through mitochondrial electron transport chain (ETC). How does plant mitochondrial ETC differ from that of animal? 2+4+2=8
 5. Write short notes on (*any four*) 2×4=8
 - a) Pasteur effect
 - b) Transamination
 - c) Regulation of pyruvate kinase
 - d) ATP Cycle
 - e) Wernicke-Korsakoff syndrome
 - f) Substrate channelling of PDH complex
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