

Use Separate Answer
Script for each Group.

M.Sc. Examination, 2019
Semester-II
Botany
Paper: MBC-22
(Plant Physiology & Biochemistry)

Time: 3 Hours

Full Marks: 48

Questions are of value as indicated in the margin

Group-A (Plant Physiology)

Answer *any three* questions

1. Explain why: 2×4=8
 - (a) Pressure potential of xylem vessels may be either positive or negative under certain conditions.
 - (b) Assimilates can pass through the petiole of a leaf in both directions.
 - (c) Excitation energy transfer is unidirectional in antenna complex of chloroplasts.
 - (d) Distal application of auxin on leaf petiole delays abscission while proximal application accelerates the process.
2. Describe the pathway of GA biosynthesis starting from *ent*-Kaurene mentioning the corresponding subcellular sites. Why are some GA biosynthesis mutants ultra-dwarf whereas others are semi-dwarf? 5+3=8
3. Characterize different types of companion cells in relation to the mode of phloem loading. Cite evidences in support of apoplastic phloem loading in plants. What is the role of P-proteins? 3+4+1=8
4. Explain how Rubisco is regulated by light emphasizing the role of Rubisco activase. Discuss critically the CO₂ concentrating mechanism in C₄ and CAM plants. 3+5=8
5. Cite experimental evidences in support of the role of circadian rhythm in photoperiodic induction for flowering. Explain how coincidence of light and *CO* gene expression accounts for flowering induction in LDP and SDP. 3+5=8

Group-B (Biochemistry)

Answer *any three* questions.

1. What is SDS? Describe its role during protein purification. Briefly describe the different steps of a large polypeptide sequencing containing disulfide bonds. 1+2+5=8
2. What is Ramachandran plot? What are the characteristics of α -helix and β -pleated sheets? What are the different types of weak interactions involved in three dimensional structure of protein? 2+4+2=8

P.T.O.

(2)

3. What is chemiosmotic hypothesis of ATP synthesis? How does equilibrium constant (K'_{eq}) related with standard free energy change ($\Delta G'^{\circ}$)? Why is ATP a high energy compound?

4+2+2=8

4. Briefly describe the irreversible steps of Embden Meyerhof Parnas pathway. Why is the glycolysis rate higher in yeast culture cells under anaerobic condition? What are the role of ubiquinone (EQ) and cytochrome C (Cyt C) in ETC?

3+2+3=8

5. Write short notes on (*any four*)

2×4=8

- a) Proton motive force
 - b) Size exclusion chromatography
 - c) Dihedral angle
 - d) Alternative oxidase(AOX)
 - e) Fermentation
 - f) Chemical uncouplers
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