B.Sc. (Honours) Examination, 2017
Semester-VI
Botany
Paper: BBC-63 (Core)
(Plant Physiology & Biochemistry)

Time: 3 Hours **Full Marks: 40**

Questions are of value as indicated in the margin

1. Answer ***any eight*** of the following: 1x8=8
   i) What are the symptoms for deficiency of phosphorus in plants?
   ii) Why is apoplastic phloem loading active process?
   iii) How does an antenna pigment differ from a reaction centre?
   iv) What is vernalization?
   v) What are the major physiological roles of ethylene in plants?
   vi) How does imbibition differ from osmosis?
   vii) What are reducing sugars? Give an example.
   viii) Why amino acids are called zwitterions?
   ix) Draw the structure of an amino acid having three pKa values.
   x) How does Gibbs free energy change (ΔG) determine spontaneity of reaction?
   xi) How does an enzyme affect ΔG and ΔG‡ (activation energy) of a reaction?
   xii) How does temperature affect enzyme kinetics?

Group-A
(Plant Physiology)
Answer ***any two*** questions

2. Discuss the biosynthetic pathways for IAA in plants. What is polar transport of auxin? Discuss the major physiological roles of auxin in plants. 3+1+4=8

3. Describe the glycolytic pathway for glucose breakdown in plants. What are the possible fates of the product of this pathway depending on O_2 availability? Write down the oxidation steps of Krebs cycle mentioning the enzymes involved therein. 5+1+2=8

4. How does water move from root to shoot in case of trees? Discuss how turgor develops in guard cells during stomatal opening. What is the influence of humidity on transpiration? 3+4+1=8

Group-B
(Biochemistry)
Answer ***any two*** questions

5. Give an account of classification of lipids based on their functions. Outline the basic structural difference between Glycerophospholipids and Sphingolipids. Discuss the types of active transport process for solute movement. 3+2+3=8

6. How does an α-helix (3.6_{13} helix) differ from β-sheet (antiparallel) structure of protein? Discuss on any three types of non-covalent interactions observed in protein structure. Draw the process of formation of a glycosidic bond. 3+3+2=8

7. Draw a Michaelis-Menten graph comparing enzymatic reactions in presence and absence of non-competitive inhibitor. How does allosteric regulation differ from covalent regulation of enzymes? Discuss the two models for allosteric regulation. 4+2+2=8

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