

II B.Tech. I Semester Supplementary Examinations, May -2005
BIO-CHEMISTRY
(Bio-Technology)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Discuss the structure of dextran polymer.
(b) What is the composition of lignin polymer?
2. Illustrate the branching points of glycogen and starch polysaccharides. Explain the salient features of these polymers.
3. (a) Explain Beta oxidation of fatty acids.
(b) Explain the alternate pathway of fatty acid oxidation in brief
4. Write about glutamate and glutamine. Describe their role in fixing nitrogen in organic molecules.
5. Describe the pathways in the biosynthesis of aromatic amino acids.
6. Schematically trace the pathways involved in the synthesis of glucose from
 - (a) Glycerol
 - (b) Aspartate
7. What is the role of NADPH in the process of converting energy from the sun to chemical energy?
8. Discuss the components of PSI and PS II and their role in photosynthesis.

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1. (a) Explain glycosidic bond with N-glycosidic and O-glycosidic bonds.
(b) How can you distinguish between the two types of glycosidic bonds?
2. Describe the mobilization of sugars from polysaccharide storage as well as synthesis
3. Explain the roles of mitochondria, endoplasmic reticulum, Peroxisomes and cytoplasm in fatty acid metabolism.
4. Write about glutamate and glutamine. Describe their role in fixing nitrogen in organic molecules.
5. Describe the pathways in the biosynthesis of aromatic amino acids.
6. Describe the pathways involved in:
 - (a) Glycogenesis
 - (b) Glycogenolysis
7. Write notes on
 - (a) chlorophylls and their role in trapping of solar energy
 - (b) anoxygenic photosynthesis
8. Plants have been said to face a dilemma of either “thirst or starvation”. Explain what this dilemma refers to. What leaf structures regulate the balance between thirst and starvation? What ratio is used to compare plants with regards to their efficiency of water use?

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1. (a) Name four monosaccharides and their natural occurrence in nature.
(b) Write their chemical structures.
(c) Discuss their importance in nature.
2. Highlight the difference between starch, dextran and glycoprotein
3. Describe the regulatory steps in the biosynthesis of
 - (a) Cholesterol
 - (b) Fatty acids
4. Write short notes on
 - (a) Biosynthesis of any three aliphatic aminoacids
 - (b) Glucogenic aminoacids
 - (c) Ninhydrin reaction
5. Describe the pathways in the biosynthesis of aromatic amino acids.
6. Describe the pathways involved in:
 - (a) Glycogenesis
 - (b) Glycogenolysis
7. Where does photosynthesis occur in an organism? How you differentiate between bacterial and plant photosynthesis system?
8. Describe how the light-dependent reactions and Calvin Cycle are chemically and energetically linked?

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1. (a) What is a limit dextrin?
(b) What is the method to prepare limit dextrin?
2. Highlight the difference between starch, dextran and glycoprotein
3. Write the structure and functions of the following:
 - (a) Palmitic acid
 - (b) Arachidonic acid
 - (c) Linoleic acid
 - (d) α -linolenic acid
4. What is an aminoacid? Justify the statement that aminoacids are building block of proteins?
5. Describe the pathways in the biosynthesis of aromatic amino acids.
6. Describe the components of electron transport system and the steps of ATP biosynthesis.
7. What is photosynthesis? Describe the bacterial photosynthesis mechanism.
8. Explain how the following factors affect photosynthesis: stomatal opening, temperature, light intensity, water availability, and CO₂ availability.
