

BEL 312: Carbohydrates & Lipids in Biotechnology
Major Test, Second Semester 2008-09

Max. Marks: 40

Time: Two Hours

Note: Questions 1 – 8 carry two marks each and Questions 9 -14 carry four marks each.

1. What is the role of bactoprenol in xanthan biosynthesis?
 2. What are junction zones? How do they help in gel formation of alginate?
 3. Illustrate the role of starch processing enzymes in the production of cyclo-dextrins.
 4. Distinguish between the characteristic features of structural polysaccharides and food storage polysaccharides.
 5. Identify any two exo-polysaccharides produced by microbial technology and indicate their chemical structure and industrial applications.
 6. Illustrate any one method for the determination of the degree of polymerization of a purified polysaccharide sample.
 7. What is the role of glycolipids and cholesterol in the functioning of biological Membranes?
 8. Indicate the role of microbial phospholipases in pathogenicity.
 9. Give examples of the following classes of lipids indicating their chemical structure and biological function:
(a) Phosphatidyl Choline (b) Prostaglandin
 10. Outline the role of lipases in the production of structured lipids.
 11. What do you understand by oxidative rancidity of oils and fats? Indicate the factors leading to oxidative rancidity in lipids.
 12. A 500 mg sample of pure vegetable oil required 95 mg of KOH for complete Saponification. The oil was also reacted with iodine. Exactly 578 mg of iodine were absorbed by 680 mg of the oil. Determine the average molecular weight and number of double bonds present in a molecule of the oil (triglyceride).
(Molecular weights: KOH = 56; I₂ = 253.8)
 13. State the four enzymatic reactions involved in the degradation of fatty acids by beta-oxidation. Summarize the complete stoichiometry for the degradation of palmitic acid by beta-oxidation.
 14. Illustrate the role of acetyl CoA carboxylase in the regulation of fatty acid synthesis.
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