

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

**SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE AWARD OF
DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE AND
TECHNOLOGY**

FOST 222: FOOD CHEMISTRY

STREAMS: BSC. FOST Y2S2

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 07/07/2021

8.30 A.M. – 10.30 P.M.

INSTRUCTIONS:

SECTION A – 30 MARKS – ANSWER ALL QUESTIONS

1. Explain the difference between bound water and free water in foods. (4 marks)
2. Explain the difference between essential and non-essential amino acids giving examples. (4 marks)
3. a) Describe functional properties of lipids in nutrition. (5 marks)
b) Hydrolytic rancidity can be caused in lipids in nutrition by two mechanisms. Explain the agents and how this can be controlled. (5 marks)
4. a) Giving examples, explain the difference between reducing disaccharide and non-reducing disaccharide. (4 marks)
b) Explain the structural differences between Amylose and amylopectin. (4 marks)
c) Retrogradation of starch is a common problem in heat starch when cooled. Explain how this occurs. (4 marks)

SECTION B-ANSWER ANY TWO QUESTIONS (40 AMRKS)

5. a) Using a graph explain a moisture sorption isotherm of low moisture foods. (10 marks)
- b) Explain the term hysteresis. (4 marks)
- c) Describe the importance of water in nutrition and food processing. (6 marks)
6. a) Explain the following structural differences in proteins. (8 marks)
- (i) Primary structure
 - (ii) Secondary structure
 - (iii) Tertiary structure
 - (iv) Quaternary structure
- b) Discuss the functional properties of protein. (10 marks)
- c) Explain the role of proteins in Maillard reactions and its significance in the food industry. (2 marks)
7. a) Explain the following terms as used in Lipids and show their importance in fat quality index. (8 marks)
- (i) Saponification value
 - (ii) Iodine value
- b) State and explain the physical properties of lipids. (5 marks)
- c) Give recommendation on how lipid oxidation can be avoided. (5 marks)
- d) Given the following formula C₁₀:₂, give the name, number of carbon atoms and double bonds of the stated fatty acid. (2 marks)
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