

**CHUKA**



**UNIVERSITY**

**UNIVERSITY EXAMINATIONS**

**EXAMINATION FOR THE AWARD OF DEGREE OF  
BACHELOR OF SCIENCE IN FOOD SCIENCE**

**FOST 222: FOOD CHEMISTRY I**

**STREAMS: BSC(FOST)Y2S2**

**TIME: 2 HOURS**

**DAY/DATE:TUESDAY 14/04/2020**

**11.30 AM – 1.30 PM**

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**INSTRUCTIONS:**

**Answer ALL Questions in Section A and any Two Questions in Section B**

**SECTION A (30 MARKS: ANSWER ALL QUESTIONS)**

1. (a) Define the term food chemistry? [3 marks]
- (b) Illustrate the structure of water and ice. [3 marks]
- (c) Draw and give an explanation of the regions in a generalized moisture sorption isotherm for low moisture foods. [6 marks]
2. Explain the following terms as used in food chemistry
  - (i) Pentosans and Hexoses
  - (ii) D-sorbital and Dulcitol
  - (iii) Verbascose and Raffinose
  - (iv) Protein-protein interaction and Protein-lipid interaction
  - (v) Flocculation and precipitation
3. Describe three methods by which lipids can be modified. [3 marks]
4. Explain the conventional methods for nitrogen determination in proteins. [3 marks]
5. Explain why Maillard reaction should be controlled? [3 marks]
6. Draw the structure of any Pentose of your choice. [4 marks]

**SECTION B (40 MARKS) ANSWER ANY TWO QUESTIONS**

7. (a) Explain the differences between non-reducing and reducing disaccharide. [4 marks]
- (b) State and explain the properties of carbohydrates. [14 marks]
- (c) Describe caramelization [2 marks]
8. (a) State 2 skeletal proteins. [2 marks]
- (b) State and explain 6 physical and chemical agents that would induce protein denaturation. [12 marks]
- (c) Explain the following functional properties of proteins; [6 marks]
- (i) Hydration
  - (ii) Surface properties
  - (iii) Stick-land reaction
9. (a) Describe static and dynamic methods used to determine lipid oxidation. [6 marks]
- (b) Lipids can be refined and modified, explain the process of refining lipids. [4 marks]
- (c) Fat characterization is done through the determination of certain values. List them. [4 marks]
- (d) Explain the physical properties of lipids. [6 marks]
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