



# MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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## University Examinations 2012/2013

FIRST YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE AND TECHNOLOGY

### AFS 2205: FOOD CHEMISTRY I

DATE: APRIL 2013

TIME: 2 HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions

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#### QUESTION ONE – 30 MARKS

- Explain how the structure of water relates to interactions between water and ionic groups, neutral groups with hydrogen bonding capabilities and hydrophobic groups. Give examples of each type of the above interactions, showing the orientation of the molecules with water. (9 Marks)
- In an experiment session, you have been given two blind samples, one is an aldose while the other is a ketose sugar. Describe quick tests that you would use to differentiate them and explain the underlying principle. (5 Marks)
- Why are some lipids solid while others are liquid at room temperature? (3 Marks)
- Discuss four desirable effects of protein denaturation in foods. (8 Marks)
- Outline five functional uses of vitamin C as an additive in food systems. (5 Marks)

#### QUESTION TWO – 20 MARKS

- The following is an excerpt of several ingredients found on the label of a brand of cake mix: sugar, sorbitol, monoglyceride of fatty acids, shortening and guar gum. Describe the effect of each ingredient on the quality attributes of the baked product. (10 Marks)
- Describe the information derived from moisture sorption isotherms. (10 Marks)

#### QUESTION THREE – 20 MARKS

Discuss factors influencing bioavailability of minerals from foods. (20 Marks)

#### QUESTION FOUR – 20 MARKS

- Discuss five pro-oxidants, which hasten the rate of autoxidation in lipids. (15 Marks)
- Explain how potato amylopectin differs from that of cereals and give favourable functional uses attributed to the unusual property. (5 Marks)

**QUESTION FIVE – 20 MARKS**

- a. Discuss three undesirable reactions involving proteins and other food components. ( 9 Marks)
- b. Discuss the stability of vitamin A during processing and bio availability in foods. (6 Marks)
- c. Why is it important to understand polymorphic forms of lipid crystals within food systems?  
(5 Marks)