



2ND SEM. 2013/14

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UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

**PROGRAMME : FOOD SCIENCE, NUTRITION AND TECHNOLOGY
YEAR II**

COURSE CODE : FSNT 206

TITLE OF PAPER : FOOD CHEMISTRY

TIME ALLOWED : TWO (2) HOURS

**INSTRUCTIONS : ANSWER QUESTION ONE (1) AND ANY OTHER
TWO (2) QUESTIONS.**

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GRANTED BY THE CHIEF INVIGILATOR**

QUESTION 1 (COMPULSORY)

- (a) What is a dispersion? Give **three (3)** types of dispersions and a food example in each type.
(9 Marks)
- (b) What is water activity (a_w)? Give **three (3)** ways to lower the water activity of food.
(6 Marks)
- (c) What is soft water and hard water?
(8 Marks)
- (d) Draw the chemical structure of the following sugars and name the glycosidic bond between the sugar units. Also explain their occurrence in food.
a. Maltose
b. Lactose
(12 Marks)
- (e) Give **two (2)** reasons for hydrogenating unsaturated oils.
(5 Marks)
- [TOTAL MARKS = 40]

QUESTION 2

- (a) Differentiate between interesterification and intraesterification. Why is it an important reaction?
(6 Marks)
- (b) Draw the structure of oleic acid (9-octadecenoic acid). What is its omega name?
(6 Marks)
- (c) Draw a starch pasting curve and indicate the following: peak viscosity, holding strength, final viscosity, breakdown, setback and total setback.
(14 Marks)
- (d) What are cyclodextrins and give **two (2)** food application of cyclodextrin?
(4 marks)

[TOTAL MARKS = 30]

QUESTION 3

- (a) Show the chemical hydrolysis reaction of triglycerides when treated with potassium hydroxide (KOH).

(8 Marks)

- (b) Saturated fatty acids have single bonds between carbon atoms. With the aid of a diagram explain how single bonds are formed between two carbon atoms.

(10 Marks)

- (c) What products of industrial use are produced by the reduction reaction of sugars (glucose and xylan) to alcohol? What are these products used for?

(6 Marks)

- (d) Explain the following protein structures:-

- i. Tertiary structure
- ii. Quaternary structure

(6 Marks)

[TOTAL MARKS = 30]

QUESTION 4

- (a) Lipids are classified into five classes. List the **five (5)** classes.

(5 Marks)

- (b) Show the reaction between glycerol and three fatty acids to form a triglyceride.

(8 Marks)

- (c) Briefly explain the action of the following enzymes and their application in food:-

- i. α -amylase
- ii. β -amylase
- iii. Rennet
- iv. Lipase

(8 Marks)

- (d) Show the reaction of glycerol under heat treatment to produce acrolein.

(9 Marks)

[TOTAL MARKS = 30]