



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences

**DEGREE IN ENVIRONMENTAL HEALTH WITH FOOD
SANITATION AND TECHNOLOGY**

MAIN EXAMINATION PAPER 2012

TITLE OF PAPER : FOOD CHEMISTRY

COURSE CODE : EHS 501

DURATION : 2 HOURS

MARKS : 100

INSTRUCTIONS :

- : READ THE QUESTIONS & INSTRUCTIONS CAREFULLY
- : ANSWER ANY FOUR (4) QUESTIONS
- : EACH QUESTION CARRIES 25 MARKS.
- : WRITE NEATLY & CLEARLY
- : BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

**DO NOT OPEN THIS QUESTION PAPER UNTIL PERMISSION IS
GRANTED BY THE INVIGILATOR.**

Question 1

- (a) Starch is normally isolated from different raw materials (corn, wheat, potatoes etc,...). It is then modified in different ways. Briefly elaborate the different stages that are involved in starch modification. **[20 Marks]**
- (b) How does Strecker degradation differ from Maillard reaction? **[5 Marks]**

Question 2

- (a) Define water activity and explain how this concept is utilized in food preservation. **[15 marks]**
- (b) Which of the following listed types of browning reactions in food are examples of non-enzymatic browning and which ones are examples of enzymatic browning?
- (i) Maillard
 - (ii) Caramelization
 - (iii) Ascorbic acid oxidation
 - (iv) Phenolase
- [4 Marks]**
- (c) Discuss van der Waals attraction forces as an aspect of colloidal interactions. **[6 Marks]**

Question 3

With the aid of examples, describe the physical and chemical agents that can bring about protein denaturation in food processing. **[25 Marks]**

Question 4

- (a) The naming of fatty acids can be explained from a nutritionist point of view or functional point of view. Discuss the differences in the approach as a way of naming fatty acids. **[10 marks]**
- (b) What is the difference between *cis* and *trans* fatty acids? **[5 Marks]**
- (c) Define an emulsion and describe the different forms of emulsions that are commonly encountered in food industry. **[10 Marks]**

Question 5

Write short notes on any five (5) of the following;

- (i) Steric Repulsion theory **[5 Marks]**
- (ii) Stabilizers and thickeners **[5 Marks]**
- (iii) Bleaching as a form of refining lipids **[5 Marks]**
- (iv) Initiation stage during chemical oxidation of lipids **[5 Marks]**
- (v) Decarboxylation of proteins **[5 Marks]**
- (vi) Oleic – Linoleic acids **[5 Marks]**
- (vii) Ascorbic acid degradation **[5 Marks]**