



UNIVERSITY OF SWAZILAND
Faculty of Health Sciences

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

SEMESTER 1 EXAMINATION

TITLE OF PAPER : FOOD CHEMISTRY

COURSE CODE : EHM 322

DURATION : 2 HOURS

DATE : DECEMBER 2014

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) Define the following terms?

- (i) Dispersion [1 Mark]
- (ii) Emulsion [1 Mark]
- (iii) Suspension [1 mark]
- (iv) Colloidal solution [1 Mark]
- (v) Water activity [1 Mark]

(b) Discuss the general causes of vitamins losses in food industry and suggest how this trend can be reduced. [20 marks]

[25 Marks]

Question 2

(a) With aid of chemical structures, differentiate the four levels of protein structures.

[20 marks]

(b) What role does protein play in the storage of food?

[5 Marks]

[25 Marks]

Question 3

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

- (i) Ascorbic acid degradation [5 Marks]
- (ii) Geographical configuration of fatty acids [5 Marks]
- (iii) Importance of the Maillard reaction in Food Technology [5 Marks]
- (iv) Briefly outline the differences between *cis* 9-Octadecenoic and *trans* 9-Octadecenoic and functionality of the different molecules [5 Marks]
- (v) Decarboxylation of proteins [5 Marks]
- (vi) Factors affecting the magnitude of the interaction of free energy (ΔG) between particles in aqueous systems [5 Marks]
- (vii) Enzymic browning, paying particular attention to Phenolase. [5 Marks]

[25 Marks]

Questions 4

(a) Discuss the differences among D-xylose, L-arabinose and D-ribose. [12 Marks]

(b) Explain how the food industry can benefit by exploiting water thermal conductivity and thermal diffusivity. [5 Marks]

(c) Discuss the factors that influence the stability of Thiamine (Vitamin B1) as one of the least stable of all vitamins. [8 Marks]

[25 Marks]

Questions 5

(a) Define the following terms;

- (i) Carbonyl [1 mark]
- (ii) Carboxyl [1 Mark]
- (iii) Enolic [1 Mark]
- (iv) Phenolic hydroxyl [1 Mark]

- (b) Why are some carbohydrates able to reduce Fehling's solution? **[2 Marks]**
- (c) What is the effect of pH on enzymatic activity **[4 Marks]**
- (d) Using practical food product examples, explain how the food industry has benefited from the process of caramellisation. **[15 Marks]**
[25 Marks]