UNIVERSITY OF SWAZILAND
Faculty of Health Sciences

DIGREE IN ENVIRONMENTAL HEALTH WITH FOOD SANITATION AND TECHNOLOGY

MAIN EXAMINATION PAPER 2013

TITLE OF PAPER	:	FOOD CHEMISTRY
COURSE CODE	:	EHM 322
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) Define the following terms?

(i) A dispersion **[1 Mark]**

(ii) An emulsion **[1 Mark]**

(iii) A suspension **[1 mark]**

(iv) A colloidal solution **[1 Mark]**

(v) Water activity **[1 Mark]**

(b) Briefly explain why Milk powder with 15 % moisture is highly unstable with respect to shelf life, whereas Milk powder with 3 % moisture has good shelf life stability (if well packaged) just as stable as flour with a 15 % moisture level. **[5 Marks]**

(c) Given the following scenario; a product at – 15 °C the a_w value is 0.86. There is no microbial growth and chemical reactions occur slowly. At 20 °C and a_w 0.86, some chemical reactions occur rapidly & some microorganisms will grow. Provide scientific explanation to support the outlined variations. **[5 Marks]**

(d) When talking about physical status of food constituents, food as dispersed systems, the shape of particles is as important as the volume fraction. Outline the effects of size in food dispersion. **[10 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]**

Question 3

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

(i) Ascorbic acid degradation **[5 Marks]**

(ii) Effects of protein denaturation **[5 Marks]**

(iii) Importance of the Maillard reaction in Food Technology **[5 Marks]**

(iv) Reversion in lipids **[5 Marks]**

(v) Decarboxylation of proteins **[5 Marks]**

(vi) Oleic – Linoleic acids **[5 Marks]**

(vii) Enzymic browning, paying particular attention to Phenolase. **[5 Marks]**

Questions 4

(a) Discuss the physical properties of lipids citing examples that are of relevance to Food Technology. **[12 Marks]**

(b) What is the main purpose of blanching food and how can the process be improved? **[5 Marks]**

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

Questions 5

(a) Using practical food product examples, explain the how the food industry has benefited from the concept of caramellisation. **[15 Marks]**

(b) Briefly differentiate between the structural components of monosaccharides and disaccharides. **[10 Marks]**