UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

B.Sc. ENVIRONMENTAL HEALTH SCIENCE AND FOOD SCIENCE

SEMESTER II

SUPPLEMENTARY EXAMINATION PAPER - JULY 2016

TITLE OF PAPER: FOOD ANALYSIS

COURSE CODE: EHM325

DURATION: 2 HOURS

INSTRUCTIONS:

1. READ THE QUESTIONS CAREFULLY.
2. ANSWER **ANY 4 QUESTIONS.**
3. EACH QUESTION CARRIES 25 MARKS. WHERE A QUESTION IS SUBDIVIDED INTO PARTS, THE MARK FOR EACH PART IS SHOWN IN BRACKETS.
4. NO PAPER SHOULD BE BROUGHT INTO THE EXAMINATION ROOM.
5. WRITE NEATLY AND CLEARLY
6. BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

SPECIAL REQUIREMENTS: NONE

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

QUESTION 1

a. Why must sugars and fatty acids be derivatised before GC analysis, while pesticides and aroma compounds need not be derivatised? [5 Marks]

b. Briefly explain the principle of detection using the Flame Ionisation Detector in GC. [5 Marks]

c. Considering the typical components and operating conditions of GC and HPLC, compare the two systems. [15 Marks]

[25 Marks]

QUESTION 2

a. Write notes on the following concepts and their applications:
   i. Ionisation suppression in Atomic Absorption Spectroscopy. [5 Marks]
   ii. Beer's Law. [6 Marks]
   iii. Wet ashing (oxidation). [5 Marks]
   iv. Saponification value. [5 Marks]
   v. Acid value. [4 Marks]

[25 Marks]

QUESTION 3

Explain the chemical basis of the following techniques that can be used to quantitate proteins:

a. Kjeldahl method. [10 Marks]

b. Dumas method. [5 Marks]

c. Biuret method. [5 Marks]

d. Lowry method. [5 Marks]

[25 Marks]

QUESTION 4

a. What is the purpose of the following procedures used in Babcock method for fat determination?

   i. Sulphuric acid addition. [3 Marks]

   ii. Centrifugation and addition of water. [3 Marks]

b. Explain the difference between the Babcock and Gerber method of extraction. [4 Marks]

c. To extract fat from a food sample, there is a choice of using either a Soxhlet or a Goldfish apparatus. Discuss the advantages and disadvantages of using each one of them. [15 Marks]

[25 Marks]

QUESTION 5

With respect to the Karl-Fischer method of moisture determination discuss the following processes:

a. Principles involved. [7 Marks]

b. Generation of iodine. [6 Marks]

c. Types of samples that are suitable for analysis using this method. [4 Marks]

d. Potential sources of error. [8 Marks]

[25 Marks]

END OF QUESTION PAPER