UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

B.Sc. ENVIRONMENTAL HEALTH SCIENCE AND FOOD SCIENCE

SEMESTER II

SUPPLEMENTARY EXAMINATION PAPER - JULY 2017

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. Define the following terms:
   i. Partition coefficient. [3 marks]
   ii. Retention time. [2 marks]
b. Discuss the advantages of thin layer chromatography (TLC) over paper chromatography. [8 marks]
c. Discuss column efficiency in chromatography in terms of:
   i. Theoretical plates. [5 marks]
   ii. Resolution. [4 marks]
   iii. Band spreading. [3 marks]

[Total: 25 marks]

QUESTION 2

a. Write notes on the following concepts and their applications:
   i. Ionisation suppression in Atomic Absorption Spectroscopy. [5marks]
   ii. Isocratic and gradient elution [5]
   iii. Wet ashing (oxidation). [5 marks]
   iv. Saponification value. [5 marks]
   v. Peroxide value [5]

[Total: 25 marks]

QUESTION 3

a. Describe the principles involved in moisture determination using reflux distillation. [15]
b. Discuss the potential sources of error associated with this method. [10]

[Total: 25 marks]

QUESTION 4

a. Use a well labelled diagram to describe layout of a gas chromatographic system. [15 marks]
b. Explain why food samples might have to be derivatised prior to analysis by gas chromatography. [5 marks]

c. Explain the principles involved in detection of analytes using Flame Ionisation Detector (FID). [5 marks]

[Total: 25 marks]

QUESTION 5

a. Describe the function of carbohydrates in food. [5]
b. Explain the difference between crude fibre and dietary fibre. [5]
c. Briefly outline the steps and principles involved in determining the carbohydrate content of food using the Englyst-Cummings procedure. [15]

[Total: 25 marks]

END OF EXAMINATION