



UNIVERSITY OF ESWATINI

FACULTY OF HEALTH SCIENCES

**B.Sc. ENVIRONMENTAL HEALTH AND FOOD
SCIENCE**

SEMESTER II

RE-SIT EXAM

JULY 2019

TITLE OF PAPER: FOOD ANALYSIS

COURSE CODE: EHS344

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 ONE

- a. Write notes on ionisation suppression in Atomic Absorption Spectroscopy. [5marks]
- b. Use a well labelled diagram to describe layout of a gas chromatographic system. [15 marks]
- c. Explain the principles involved in detection of analytes using Flame Ionisation Detector (FID). [5 marks]

[TOTAL: 25marks]**QUESTION TWO**

- a) Define dietary fibre in terms of:
- i. Its physiological function. [2 marks]
 - ii. Its chemical composition. [3 marks]
- b) Explain the purpose of each of the following steps used in the determination of dietary fibre:
- i. Heating sample and treating with α -amylase. [4 marks]
 - ii. Treating sample with glucoamylase. [4 marks]
 - iii. Treating sample with protease. [2 marks]
- c) Define gelatinisation. [2 marks]
- d) Describe the principles used in Englyst-Cummins procedure for carbohydrate determination. [8 marks]

[TOTAL: 25 marks]**QUESTION THREE**

- a. Describe the difference in procedure and efficiency between the Soxhlet method and Babcock method for fat determination. [10 marks]
- b. State the reasons why it may be necessary to characterise the composition of fat. [5 marks]

- c. What information is obtained by carrying out the following tests on fat?
- i. Smoke point. [2 marks]
 - ii. Iodine value. [4 marks]
 - iii. Saponification value. [4 marks]

[TOTAL: 25 marks]

QUESTION FOUR

- a. Draw a schematic representation of a high performance liquid chromatography (HPLC) system. [15 marks].
- b. Explain the nature and role of the following components on the HPLC system:
- i. Guard column. [5 marks].
 - ii. UV-Visible detector. [5 marks].

[TOTAL: 25 marks]

QUESTION FIVE

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

[TOTAL: 25 marks]

END OF QUESTION PAPER