



UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

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

SEMESTER II

MAIN EXAM

MAY 2018

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 1

Write notes on the following:

- a. Reflux distillation in moisture determination. [5 marks]
- b. Wet oxidation. [5 marks]
- c. Gravimetric analysis. [5 marks]
- d. Volumetric analysis. [5 marks]
- e. Proximate analysis. [5 marks]

[Total: 25 marks]

QUESTION 2

- a. The Kjeldahl method for protein determination is often described as a classical method of analysis. Explain what this description means. [5 marks]
- b. Describe the steps involved in the Kjeldahl determination of protein. In your answer, explain why each of the steps is necessary. [20 marks]

[Total: 25 marks]

QUESTION 3

- a. Explain the principle applied in the determination of fat using the Soxhlet method. [4 marks]
- b. Explain why it is recommended to use a dried sample for Soxhlet extraction of fat. [4 marks]
- c. Explain what property of fat is determined during the following tests:
 - i. Peroxide value. [5 marks]
 - ii. Saponification value. [6 marks]
 - iii. Acid value. [6 marks]

[Total: 25 marks]

QUESTION 4

- a. Define dietary fibre. [2 marks]
- b. List the major constituents of dietary fibre. [4 marks]

- c. What is the physiological definition and the chemical nature of resistant starch? [6 marks]
- d. State the principles and procedure involved in determining carbohydrate content of food using the Englyst-Cummings procedure. [13]

[Total: 25 marks]

QUESTION 5

- 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]

[Total: 25 marks]

END OF EXAMINATION