



UNIVERSITY OF SWAZILAND
FACULTY OF HEALTH SCIENCES
B.Sc. ENVIRONMENTAL HEALTH SCIENCE
SEMESTER II
FINAL EXAMINATION PAPER - MAY 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 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. [4 marks]
- c. Explain the difference between gravimetric and volumetric analysis. Use examples to illustrate your answer. [8 marks]

[Total: 25 marks]

QUESTION 2

- a. Analysis of an oil sample gives the following results. What does each of the results tell about the characteristics of the sample?
 - i. Large saponification value. [5 marks]
 - ii. Low iodine value. [5 marks]
 - iii. High TBA number. [5 marks]
- b. You are responsible for writing the specifications for vegetable oil purchased from a supplier for use in deep fat frying. State the tests that should be included on the specifications. [5 marks]
- c. For **TWO** of the tests in (b) above, state the useful information provided by each test. [5 marks]

[Total: 25 marks]

QUESTION 3

- a. Explain the difference between the following terms:
 - i. Dry ashing and wet oxidation. [4 marks]
 - ii. Atomic Absorption Spectroscopy (AAS) and Atomic Emission Spectroscopy (AES). [6 marks]
- b. In the determination of iron in a sample of wheat grains using AAS, the blank results were high.

- i. Define a blank. [2 marks]
- ii. Explain whether this result is acceptable or not, and what could be the cause of this observation. [4 marks]
- c. Briefly discuss the purpose of each of the following items associated with Atomic Absorption Spectroscopy.
 - i. Dilute HCl. [2 marks]
 - ii. Nebuliser. [2 marks]
 - iii. Burner. [2 marks]
 - iv. Monochromator. [3 marks]

[Total: 25 marks]

QUESTION 4

Explain the principles involved in the determination of protein using the following methods:

- a. Kjeldahl method. [10 marks]
- b. Dumas method. [5 marks]
- c. Biuret method. [5 marks]
- d. Lowry method. [5 marks]

[Total: 25 Marks]

QUESTION 5

Discuss the Karl-Fischer method of moisture determination under the following headings:

- a. Reactions involved. [4 marks]
- b. Volumetric titration. [6 marks]
- c. Coulometric titration. [6 marks]
- d. Sources of error. [9 marks]

[Total: 25 marks]

END OF EXAMINATION