UNIVERSITY OF SWAZILAND

FACULTY OF HEALTH SCIENCES

B.Sc. ENVIRONMENTAL HEALTH SCIENCE

SEMESTER II

MAIN EXAMINATIONS

TITLE OF PAPER: FOOD ANALYSIS

COURSE CODE: EHS502

DURATION: 2 HOURS

DATE: MAY 2014

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. BEGIN EACH QUESTION ON A SEPARATE SHEET OF PAPER.

SPECIAL REQUIREMENTS: CALCULATOR

DO NOT OPEN THE QUESTION PAPER UNTIL INSTRUCTED TO DO SO BY THE INVIGILATOR.

QUESTION 1

a. Explain the procedure that you would use to obtain a representative sample for mycotoxin analysis from maize bags stacked in a pile. [10]

b. Describe the modifications (derivatisation) that you may need to do under the following circumstances:

    i. Aflatoxin analysis by HPLC. [7]

    ii. Fatty acid analysis by Gas Chromatography. [8]

[25]

QUESTION 2

a. Briefly explain the principles involved in the following protein determination techniques:

    i. Kjeldahl method. [10]

    ii. Formol titration. [5]

    iii. Biuret method. [5]

b. Given that the nitrogen content (as ammonia – NH_3) in 0.2 g sample of maize meal was found to be 0.02 moles, calculate the protein content of the sample. [5]

[25]

QUESTION 3

a. Describe the difference in procedure and efficiency between the Soxhlet method and Babcock method for fat determination. [10]

b. State the reasons why it may be necessary to characterise the composition of fat. [5]

c. What information is obtained by carrying out the following tests on fat?

    i. Smoke point. [2]

ii.   Iodine value. [4]

iii.   Saponification value. [4]

[25]

QUESTION 4

a. Define the following terms:

    i. Partition coefficient. [2]

    ii. Relative front value. [2]

    iii. Reversed phase chromatography. [2]

    iv. Gradient elution. [4]

b. Discuss the concept of column efficiency under the following headings:

    i. Resolution. [5]

    ii. Theoretical plates and height equivalent to theoretical plate. [5+5]

[25]

QUESTION 5

a. Distinguish between crude fibre and dietary fibre. [10]

b. Describe the steps involved in the Englyst-Cummings procedure for starch determination. Mention its limitations. [15]

[25]

THE END