2ND SEM. 2015/16

UNIVERSITY OF SWAZILAND

SUPPLEMENTARY EXAMINATION PAPER

PROGRAMME	:	FOOD SCIENCE, NUTRITION AND TECHNOLOGY YEAR III
COURSE CODE	:	FSNT 307
TITLE OF PAPER	:	FOOD NUTRIENT ANALYSIS
TIME ALLOWED	:	TWO (2) HOURS
INSTRUCTIONS	:	ANSWER QUESTION ONE (1) AND ANY OTHER TWO (2) QUESTIONS.

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QUESTION 1 (COMPULSORY)

(a) Discuss the **three (3)** forms of water and indicate which form is not determined by the oven drying method. **(8 Marks)**

(b) A soy bean sample has a moisture content of 8% and a crude fat content of 30%. Calculate the percentage fat content on dry weight basis. **(4 Marks)**

(c) Explain how you would conduct the following procedures:-

i. Random sampling **(3 Marks)**
ii. Systematic sampling **(3 Marks)**
iii. Composite sampling **(3 Marks)**
iv. Stratified sampling **(3 Marks)**

(d) Explain the following fat characteristics:- **(12 Marks)**

i. Iodine number
ii. Peroxide value
iii. Solid fat index
iv. Acid value

(e) The equation of a standard calibration curve (protein concentration (µg/ml) on x-axis vs absorbance at 650 nm on y-axis) is $y = 0.0061x + 0.0048$. Calculate the concentration of a sample with a mean absorbance value of 0.38. **(4 Marks)**

[TOTAL MARKS = 40]

QUESTION 2

(a) Explain the principles of the following methods for moisture content determination:-

i. Distillation method **(4 Marks)**
ii. Gas production method **(4 Marks)**

(b) Describe the equipment in high performance liquid chromatography (HPLC) system and its function. **(12 Marks)**

(c) Explain the following terms in column chromatography:-

i. Stationary phase **(2 Marks)**
ii. Mobile phase **(2 Marks)**

(d) Give **three (3)** sources of organic nitrogen sources other than protein that contribute to the crude protein content of food as determined by the Kjeldahl nitrogen determination method. **(6 Marks)**

[TOTAL MARKS = 30]

QUESTION 3

(a) Explain the following:-

i. Consumers risk in sampling **(3 Marks)**
ii. Vendors risk in sampling **(3 Marks)**
iii. Continuous sampling **(3 Marks)**
iv. Manual sampling **(3 Marks)**

(b) What is an outlier? **(4 Marks)**

(c) List the **four (4)** types of liquid chromatography. **(8 Marks)**

(d) Explain the principles of the Geber method for fat content determination in milk. **(6 Marks)**

[TOTAL MARKS = 30]

QUESTION 4

(a) Give **four (4)** examples where pH measurement is an important aspect of analysis in the food industry. **(8 Marks)**

(b) Differentiate between strong and weak acids. **(6 Marks)**

(c) Explain the following indirect protein determination methods:-

i. Biuret method **(5 Marks)**
ii. Dye binding method **(5 Marks)**

(d) Explain the "difference" method for determining the carbohydrate content of food and **three (3)** disadvantages of this method. **(6 Marks)**

[TOTAL MARKS = 30]