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**University Examinations 2014/2015**

SECOND YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN FOOD SCIENCE AND TECHNOLOGY AND FOOD SCIENCE AND NUTRITION

**AFT 3275: FOOD ANALYSIS**

 **DATE: APRIL 2015 TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Define food analysis (1 Mark)
2. Differentiate the following terms as used in food analysis (5 Marks)
3. Precision and accuracy
4. Reproducibility and sensitivity
5. Specificity and simplicity
6. Destructive and nondestructive analytical methods
7. Population and sample
8. List two food analytical methods
9. Briefly describe standards of quality (2 Marks)
10. Briefly discuss proximate analysis (2 Marks)
11. (i) Distinguish between a continuous and compartmentalized population (2 Marks)

(ii) State the importance of sensory analysis in the food industry (2 Marks)

(iii) Briefly discuss physicochemical properties of food (5 Marks)

1. (i) State four reasons for carrying out a chemical analysis (2 Marks)

(ii) List four reasons for analyzing food (2 Marks)

(iii) Define a laboratory sample and briefly discuss the steps followed in food analysis

 (5 Marks)

**QUESTION TWO (20 MARKS)**

1. Briefly discuss factors that determine choice and validity of a method to be used in food analysis (5 Marks)
2. Distinguish between attribute sampling and variable sampling (2 Marks)
3. You are in-charge of quality control in an infant food company. During one of your routine analysis you determine the fat content of food and you got the following values:

Initial weight (wet) of the sample – 40g

Final weight after analysis – 15g

Weight of the thimble 2.5g

Weight of glass wool – 2g

1. Calculate the fat content of the food (2 Marks)
2. If the moisture content of the food is 0.5%, what is the fat content of the food on dry basis? (2 Marks)
3. How much energy would a gram of this food provide based on fat content?

 (2 Marks)

1. Differentiate between the molecular structure and macroscopic structure of food

(2 Marks)

1. Describe the three basic types of sampling plans (5 Marks)

**QUESTION THREE (20 MARKS)**

1. To determine the concentration of carbohydrates (glucose) in a diet for the elderly, a known

Concentration of glucose was used to generate the standard curve and the following data was obtained:-

|  |  |
| --- | --- |
| **Glucose concentration (mg/dl)** | **Abscorbance at 490 nm** |
| 0 | 0.0001 |
| 20 | 0.0504 |
| 40 | 0.0893 |
| 60 | 0.1004 |
| 80 | 0.1314 |
| 100 | 0.1621 |
| 120 | 0.1903 |

1. Using the graph paper provided, construct a standard curve using the data above (2 Marks)
2. If the abscorbance of the diet was 0.1098, using the standard curve, determine the glucose content in the food (2 Marks)
3. If the absorbance was generated by 1 g of the food sample, what is the concentration of glucose in 1 kg of the food? (2 Marks)
4. Calculate the energy (kilocalories) generated by a gram of this food based on carbohydrates (2 Marks)
5. (i) State the factors that determine the choice of a sampling plan (3 Marks)

(ii) Discuss the major sources of variability in nutrient composition of a food (4 Marks)

1. Discuss sensory analysis tests used in food industry (5 Marks)

**QUESTION FOUR (20 MARKS)**

1. State the three forms of water in food products (3 Marks)
2. List four methods used in protein analysis (4 Marks)
3. Differentiate between dry ashing and wet ashing (4 Marks)
4. List four instrumental analysis of food (4 Marks)
5. Describe factors affecting a sampling plan (2 Marks)
6. Differentiate between saponification value and iodine value (1 Mark)
7. List factors that affect the accuracy of HPLC (2 Marks)