Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2019/2020

COURSE NAME	:	FOOD ANALYSIS
COURSE CODE	:	BWD 21303
PROGRAMME CODE	:	BWD
EXAMINATION DATE	:	DECEMBER 2019/JANUARY 2020
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

Q1 (a) Differentiate between moisture content and water activity measurements.

(4 marks)

(b) Explain a method to measure the moisture content of cornflakes for:

(i) Rapid quality control.

(2 marks)

(ii) A research project.

(2 marks)

(c) One sample of condensed soup were analyzed to determine whether it was reduced to the correct concentration. It was found that the concentration is 26.54 % solids by gravimetric means. The standard concentration is 28.63 %. Calculate the volume of water need to be removed if the starting volume were 1000 gallons at 8.67 % solids and the weight of the solids is 8.5 pounds per gallon.

(6 marks)

(d) A grain sample was found to contain 10.5 % moisture. A 5.2146 g of the same sample was placed into a crucible (28.5053 g tare). The ashed crucible weighed 28.5939 g.

(i) Calculate the percentage ash on an as-received (wet weight) basis.

(4 marks)

(ii) Calculate the percentage ash on a dry matter basis.

(4 marks)

(e) Solubility in organic solvents is the basis for separation of lipids from other food components. Explain why there is no single universal solvent for lipid extraction.

(4 marks)

Q2 (a) Recommend a solution to overcome the following problems that could arise in dry ashing of various foods:

(i) Partially loss of phosphorus due to volatilization during the determination of phosphorus content.

(2 marks)

(ii) Incomplete combustion of a high sugar product after a typical dry ashing procedure, in which the ash is dark colored, not white or pale gray.

(2 marks)

(iii) The typical procedure takes too long to conduct.

(2 marks)

(iv) The compound measured after dry ashing may be reacting with the porcelain crucibles being used.

(2 marks)

(v) The iron is unable to solubilize after the dry ashing procedure.

(2 marks)

(b) The Soxhlet extraction procedure utilized petroleum ether. What were the advantages of using it compared to ethyl ether?

(5 marks)

(c) If the fat content measured was differed from that written on the nutrition label, explain the possible reason.

(5 marks)

(d) Summarize how solubility characteristics can be used in an extraction procedure to separate monosaccharides and oligosaccharides from polysaccharides.

(5 marks)

Q3 (a) Describe two methods for determination of pectin in fruit juice sample.

(2 marks)

(b) A corn flour sample Brand A was analyzed using Kjeldahl and Nitrogen combustion methods. List the advantages and disadvantages of both methods to justify the error.

(8 marks)

(c) Differentiate and explain the chemical basis of the following techniques that can be used to quantify proteins in quality control:

(i) Dumas method (N combustion).

(3 marks)

(ii) Infrared spectroscopy.

(3 marks)

(iii) Biuret method.

(3 marks)

(iv) Lowry method.

(3 marks)

(v) Bicinchoninic acid method.

(3 marks)

Q4 (a) Aminah performed fat analysis on a new super energy shake (high carbohydrate and protein) using standard Soxhlet extraction.

(i) Predict the outcome of fat content in the sample. Justify your answer.

(6 marks)

(ii) Based on your answer in **Q4(a)(i)**, how would you modify the standard procedure to correct the problem.

(6 marks)

(b) The Munson-Walker, Lane-Eynon, and Somogyi-Nelson methods can be used to measure reducing sugars. Compare and contrast these methods with regard to the principles involved and the procedures utilized.

(12 marks)

-END OF QUESTION-