UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2014/2015

COURSE NAME	:	FOOD ANALYSIS I
COURSE CODE	:	BWD 20303
PROGRAMME	:	2 BWD
EXAMINATION DATE	:	DECEMBER 2014 / JANUARY 2015
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

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

Q1 (a) Describe **TWO (2)** factors that have to be considered when choosing a method for protein determination.

(4 marks)

(b) 27.0 mL of 0.31 M NaOH is titrated with 0.74 M H_2SO_4. How many mL of H_2SO_4 are needed to reach the end point?

(4 marks)

(c) Differentiate the chemical basis of the following techniques that can be used to quantitate proteins in quality control/research:

i. Kjeldahl method
ii. Lowry method

(6 marks)

(d) You return from a week vacation and ask your lab technician about the pH of the apple juice sample you gave him or her before you left. Having forgotten to do it before, the technician calibrates a pH meter with one standard buffer stored next to the meter and then reads the pH of the sample of unpasteurized apple juice immediately after removing it from the refrigerator (40 °F), where it has been stored for 2 weeks. Identify the reasons why this stated procedure could lead to inaccurate or misleading pH values.

(6 marks)

Q2 (a) A vegetable (23.5 g) was found to have 0.094 g acid-insoluble ash. Determine the percentage of acid-insoluble ash of the vegetable.

(3 marks)

(b) Classify the types of water in the food stuff.

(4 marks)

(c) Seed moisture content is one of the most important factor influencing seed quality and storability. Therefore, its estimation during seed quality determination is important. Explain **ONE (1)** factor that affects the optimum method for moisture testing.

(4 marks)

(d)   Your laboratory just received an apple sample to analyze for moisture content. Based on the results from oven drying method (**Table Q2**), calculate the moisture content of this sample.

Table Q2

Dish no.	Weight of empty dish	Weight of initial sample	Weight of final sample
1	43.48 g	3.33 g	0.494 g
2	13.74 g	3.24 g	0.548 g
3	22.18 g	3.29 g	0.534 g

(9 marks)

Q3   (a)   As a final year student, you want to determine the ash content of buttermilk by conventional dry ashing.

(i)   Identify **TWO (2)** potential sources of error in the preparation of samples for ash analysis and describe a way to overcome each (the value of ash content is approximately 8.3 % - 8.8 %).

(5 marks)

(ii)   Your supervisor asks you to switch to a conventional wet ashing method because he has heard it takes less time than dry ashing. Summarize the advantages and disadvantages of wet ashing and dry ashing. Based on the summary, do you still want to continue using dry ashing?

(15 marks)

Q4   (a)   List **FOUR (4)** foods rich in monounsaturated fats.

(4 marks)

(b)   You analyze oil FAME by gas chromatography.

(i)   Find the following areas for your peaks, as shown in **Table Q4.**

Table Q4

18:0	1, 182738
18:1$n - 9$	38, 999438
18:2$n - 6$	14, 344172
18:3$n - 3$	2, 148207

(8 marks)

(ii)   Identify the lipid according to saturation.

(8 marks)

Q5   Pet owners often wonder whether their dog food is high in protein, fat, or carbohydrates, the macro nutrients of the food. Unfortunately, the answer to these questions is not easily attainable from the dog food label. Based on **Table Q5**, as a food analyst:

i.   Determine the percentage of carbohydrate and propose a guaranteed analysis based on dry matter basis.

Table Q5

Nutrient	As Fed
Crude Protein	26.0 %
Crude Fat	16.0 %
Crude Fiber	3.0 %
Moisture	10.0 %
Ash	7.5 %

(12 marks)

ii.   Dogs are meant to eat high protein and high fat diets. Design a new formula for dog foods based on dry matter basis (Hint (as fed): 35 % protein, 19 % fat, and 37 % carbohydrates, 10 % moisture).

(8 marks)

END OF QUESTION