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**UNIVERSITI TUN HUSSEIN ONN
MALAYSIA**

**FINAL EXAMINATION
SEMESTER I
SESSION 2013/2014**

COURSE NAME : NUTRITION
COURSE CODE : BWD 20203
PROGRAMME : 2BWD
EXAMINATION DATE : DECEMBER 2013/JANUARY 2014
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL **FIVE (5)**
QUESTIONS

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

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Q1 Macronutrients are nutrients that provide calories or energy. Nutrients are substances needed for growth, metabolism, and for other body functions.

(a) Enumerate the important macronutrients.

(3 marks)

(b) How many calorie(s) does each macronutrient provides per gram?

(3 marks)

(c) According to standard Dietary Reference Intakes, how many percent of our total calorie intake should come from protein?

(2 marks)

(d) According to standard Dietary Reference Intakes, how many percent of our total calorie intake should come from lipids?

(2 marks)

Q2 Dietary assessment encompasses food supply and production at the national level, food purchases at the household level, and food consumption at the individual level. Enumerate and describe briefly each dietary assessment methods.

(10 marks)

Q3 (a) Anthropometry is the hallmark technique of biological anthropology, and has become increasingly important in health assessments across this century. It is known as the study of the measurement of the human body in terms of the dimensions of bone, muscle, and adipose (fat) tissue.

(i) Is it possible to detect malnutrition using anthropometric data? Explain your answer briefly.

(5 marks)

(ii) What are the most common anthropometric measures used to indicate malnutrition? Describe each one briefly.

(10 marks)

(b) Estimate your resting energy needs, considering your height, weight, age, and gender using Harris and Benedict equation:

men = $13.8x$ (kg) + $5x$ (cm) - $6.8x$ (age in yrs) + 66.5

women = $9.6x$ (kg) + $1.8x$ (cm) - $4.7x$ (age in yrs) + 655.1

(5 marks)

- Q4** (a) Iron and zinc are currently the trace minerals of greatest concern when considering the nutritional value of vegetarian diets. With elimination of meat and increased intake of phytate-containing legumes and whole grains, the absorption of both iron and zinc is lower with vegetarian than with non-vegetarian, diets.
- (i) Explain the importance of iron and zinc in human health.
(5 marks)
- (ii) Explain the consequence and advantage of vegetarian diet in terms of zinc and iron supply to the diet.
(5 marks)
- (iii) Explain the reason why the bioavailability of dietary iron and zinc is lower in plants.
(5 marks)
- (b) Recent studies have indicated that the activity of lipoprotein lipase in rat adipose tissue is related to the nutritional state of the animal. Fasting induces a fall in the activity released from surviving tissue by heparin and in the activity of homogenates of adipose tissue, while glucose and insulin in vitro increase the heparin effect on the release of lipase from surviving adipose tissue of fasted rats.
- (i) Explain the consequences and advantages of fasting in terms of glucose and insulin level in the blood.
(10 marks)
- (ii) Explain the relationship between the lipoprotein lipase activity and the nutritional state of an organism.
(5 marks)
- (c) The control of food intake involves multifaceted interplay between diverse hypothalamic neuronal systems together with their interaction with reporter systems that convey peripheral information to the central neuronal systems. Several studies have demonstrated that the peripheral endocrine information provided by reproductive tissue is involved in the physiological control of appetite in mammals.
- (i) Explain the consequence of diet preparation in controlling animal reproduction.
(10 marks)

- (ii) Explain the multifaceted interplay involved in the control of food intake in mammals.

(5 marks)

- Q5** (a) Vitamins are organic molecules that help regulate body processes. There are 2 types of vitamins, the fat soluble and water soluble. Group the vitamins as in **Table 1** below according to their solubility; provide the food sources and function of each vitamin:

A (retinol), D (calciferol), E (tocopherol), K, B₁ (thiamine), B₂ (riboflavin), Niacin, B₆ (pyridoxine), Pantothenic acid, Folic acid, B₁₂ (cyanocobalamin), C (ascorbic acid), Biotin, Choline

Table 1. Vitamin groups

Vitamins	Solubility	Source	Function of the vitamins in the body

(10 marks)

- (b) It is estimated that one third of the cancer deaths each year in the world can be attributed to nutrition and other lifestyle factors. Hence, by opting for a healthy lifestyle can cancer be possibly prevented. Using the knowledge obtained from the course, prepare a guideline for cancer prevention.

(5 marks)

- END OF QUESTION -