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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2019/2020**

COURSE NAME : OIL AND FATS TECHNOLOGY
COURSE CODE : BWD 30503
PROGRAMME CODE : BWD
EXAMINATION DATE : DECEMBER 2019 / JANUARY 2020
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

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- Q1** Oil and fat is a mixture of 96-98% triacylglycerols, with the balance consisting 2-4% non-triglycerides, which could be grouped as major and minor components.
- (a) Name **FOUR (4)** minor components of non-triglycerides. (4 marks)
- (b) Name **FOUR (4)** major components of non-triglycerides. (4 marks)
- (c) Name and draw **ONE (1)** structure of each component in **Q1(b)**. (12 marks)
- (d) Describe the function of fat/oil in chocolate products. (5 marks)
- Q2** Analyses of oil/fat are required for a number of applications, beginning with commodity trading, refining and development of the products. Such application is to determine the quality of the products.
- (a) Point out **THREE (3)** instrumental methods that could be used to determine the content of oil/fat in food products. Explain your answer. (6 marks)
- (b) Margarines made from rapeseed, sunflower and soybean oil after hydrogenation tend to develop β crystals.
- (i) Define hydrogenation of margarine in industrial practices. (4 marks)
- (ii) Draw **ONE (1)** structure of triglyceride that might contain in the oils which tend to form β_3 crystal. (5 marks)
- (iii) Outline the experiment to determine the degree of unsaturation of the products after hydrogenation process is conducted. (10 marks)
- Q3** Oils and fats extraction and processing consist of a series of unit processes in which causing both physical and chemical changes to the raw materials.
- (a) By using suitable graphic organizer, distinguish between mechanical press extraction and solvent extraction. (5 marks)
- (b) Discuss the extraction and processing steps of oil palm fruits mesocarp until the refined oil is produced. (20 marks)

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- Q4** Processing of animal fats and vegetable oils has led to development of numerous edible lipid-based products useful as food ingredients, cooking medium and nutritional supplement.
- (a) Differentiate the fats and oils recovery process between animal and plant origin.
(4 marks)
 - (b) Production of one of the animal fat-based products involves destabilization of an oil in water (o/w) emulsion system to produce a stable water in oil (w/o) emulsion system. Discuss the process flow related to this product.
(10 marks)
 - (c) Shortening is commonly used for quality enhancement of bakery products.
 - (i) As a food technologist at PalmWorld Sdn Bhd, develop a new formulation for trans-free vegetable-based shortening suitable for cakes, cookies and puff pastry.
(8 marks)
 - (ii) Justify why the formulation given in **Q4(c)(i)** can be categorized as trans-fat free shortening.
(3 marks)

-END OF QUESTIONS -

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