



UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2017/2018**

COURSE NAME : OIL AND FATS TECHNOLOGY
COURSE CODE : BWD 30503
PROGRAMME CODE : BWD
EXAMINATION DATE : DECEMBER 2017 / JANUARY 2018
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

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

Q1 Oils and fats are the raw materials for varieties of food products in food industries.

- (a) Define oils/fats. (2 marks)
- (b) With suitable graphic organizer, differentiate the terms oils and fats in food industries. (8 marks)
- (c) Write the abbreviated form of each following fatty acids:
- (i) α -Linolenic acid
 - (ii) Stearic acid
 - (iii) Docosahexaenoic acid
 - (iv) Elaidic acid
- (4 marks)
- (d) Draw **ONE (1)** structure of oil that contain any suitable fatty acid of your choice in **Q1(c)**. (2 marks)
- (e) Choose omega-3 fatty acid in **Q1(c)**. (4 marks)

Q2 Analytical procedures for oils and fats are driven partly by the desire to identify and quantify materials being examined in the research laboratory and commercial demands.

- (a) Describe briefly **FOUR (4)** important properties of oil and fat of concern to the food analyst. (8 marks)
- (b) **Figure Q2(b)** demonstrate the graph of temperature dependence of the ultrasonic velocity of fish analogs (A - F) containing the same overall solid-non-fat content, but different oil content. Rank in descending order the oil content of fish sample A to F. Justify your answer. (6 marks)
- (c) Pagoh Snack Sdn. Bhd. is a manufacturer of varieties of fried snack and confectionary. They usually use imported vegetable oil as cooking oil. However, their earning is become lower due to decreasing value of Malaysian ringgit. So, to overcome the problem, they decided to change to local supplier for the cooking oil without jeopardize the quality and customer acceptance. As quality assurance officer, outline the methodology of sensory evaluation should be conducted before selection is made. (6 marks)

- Q3** Reactions of oils and fats could be occurred during processing and storage.
- (a) Explain **FOUR (4)** types of fats deterioration. (8 marks)
- (b) With suitable graphic organizer, compare and contrast between saponification, peroxide, thiobarbituric acid and iodine value test. (12 marks)
- Q4** Panchor Margarine Sdn. Bhd. produce margarine by using a mixture of olive oil and palm oil with partial hydrogenation process.
- (a) Describe margarine according to Food Act 1983 (Act 281). (4 marks)
- (b) Two form of crystal nucleus was found as the major cause to grainy texture of the margarine. The crystals structure were identified as POP and StOSt (where P = palmitic, O = oleic, St = stearic). Predict and draw the stable space arrangement of each of the crystal structure. (6 marks)
- (c) During hydrogenation process, the company used nickel as catalysts. The condition for temperature, pressure and agitation speed were set at 400°C, 20 psig and 60 rpm respectively. Explain how the selection of the condition of the variables can affect the trans-fat formation in the margarine product. (10 marks)
- Q5** Tangkak Oil Sdn. Bhd. is a manufacturer of palm oil based products that are cooking oil, margarine and vanaspati. Their plant consists of oil mill processing section and products manufacturing section. After five years operation they realize that such wastes/ by-products could be changed to valuable products. As food technology consultant,
- (a) Determine and explain **FOUR (4)** types of promising by-products could be turned to valuable products might be produced by the factory plant. (8 marks)
- (b) Propose the valuable products that could be obtained from each by-product. Justify your answer. (12 marks)

-END OF QUESTIONS -

FINAL EXAMINATION

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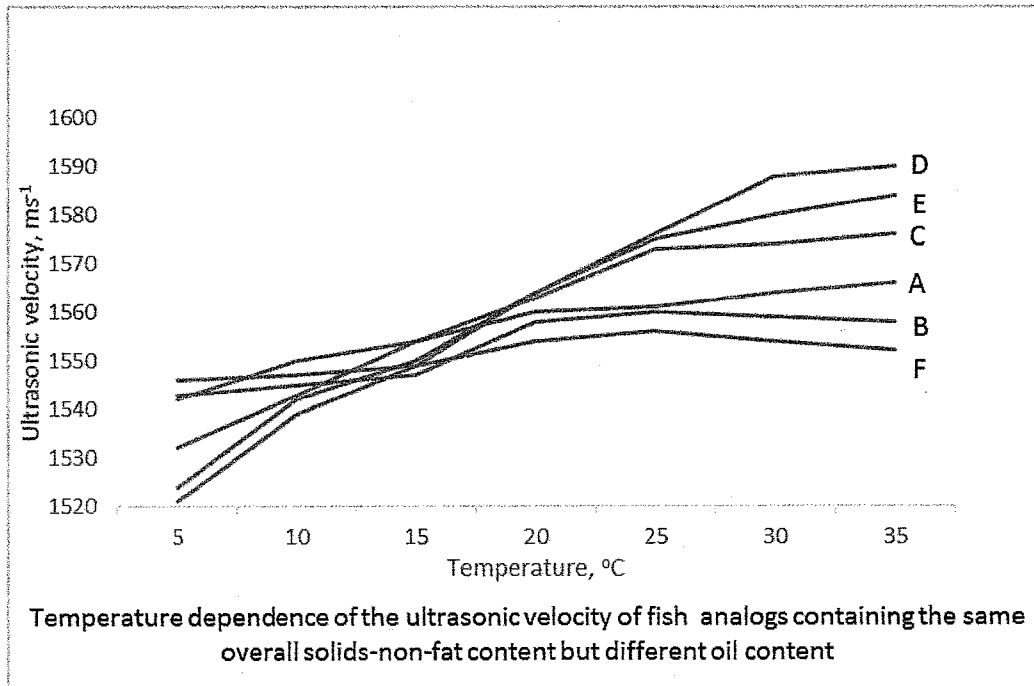


Figure Q2 (b)