

**CONFIDENTIAL**



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2014/2015**

**COURSE NAME : FOOD PROCESSING TECHNOLOGY I**  
**COURSE CODE : BWD 21003**  
**PROGRAMME : 2 BWD**  
**EXAMINATION DATE : JUNE 2015/JULY 2015**  
**DURATION : 3 HOURS**  
**INSTRUCTION : A) ANSWER ALL QUESTIONS**  
**B) ANSWER ONE (1) QUESTION ONLY**

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

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**SECTION A**

- Q1** (a) List and describe **THREE (3)** types of forces used to reduce size of solid foods. (6 marks)
- (b) UHT is a process used to sterilize wide range of liquid foods such as milk and fruit juices. Briefly explain its advantages. (4 marks)
- (c) Plate heat exchanger is common equipment used for pasteurization of liquids in food industry. How does this equipment can be used to pasteurize milk? Use an illustration to support your answer. (10 marks)
- Q2** (a) A barrel of watermelon juice is needed to undergo an evaporation in order to produce a concentrate product for subsequent process.
- (i) Demonstrate the process using the theory of evaporation.
- (ii) Draw a schematic diagram of the steady state operation of an evaporator.
- (iii) Describe **ONE (1)** factor influencing the economics of evaporation. (10 marks)
- (b) Energy can be saved by re-using heat contained in vapours produced from the boiling food by multiple effect evaporator. Compare the figures and advantages of **TWO (2)** arrangements by using triple-effect evaporation as an example. (10 marks)
- Q3** (a) An experiment of drying was conducted using banana slices to improve the quality of dried banana chips.
- (i) Explain briefly the drying mechanism of banana slices during the experiment.
- (ii) Provide an illustration to support your answer at (i). (10 marks)
- (b) **Figure Q3(a)** demonstrates the drying of a single layer of grain exposed to a constant flow of air. Interpret the data presented in the figure. (10 marks)
- Q4** (a) Describe the effects of frying by using high temperatures between 180 °C and 200 °C. (2 marks)
- (b) A group of program Bachelor of Food Technology students was visited an open-day of the famous potato chips factory in town. During the visit, the Food Technologist had demonstrated the frying process and explained its

theory. As a student, you are required to write a report about the knowledge gained from the demonstration.

(8 marks)

- (c) A customer of a fast-food restaurant orders a set of double cheese burger with complimentary french fries and soft drink. **TWO (2)** main methods of commercial frying are applied during the preparation.
- (i) Classify the products involved in both frying methods. Why do you think those frying methods are related to produce the products?
- (ii) Illustrate heat and mass transfer diagrams in both methods.

(10 marks)

**SECTION B**

- Q5** (a) Mechanical refrigerator and cryogenic systems are chilling equipment which is classified by the method used to remove heat. Differentiate both systems and use an illustration if necessary.

(10 marks)

- (b) A meat vendor wants to keep his meat in the freezer with temperature of -22 °C. The meat has a freezing point of -2 °C and takes 6 hours to form crystallisation during freezing. According to the data given, plot and explain a time-temperature curve and its components, respectively.

(10 marks)

- Q6** (a) Hard and soft coating are the main types of processes to manufacture the pan-coated products. Compare and contrast both processing.

(10 marks)

- (b) A safe, home-smoked fish requires a good understanding of the procedures and precautions needed to prevent food poisoning. Develop the procedures of smoking process that must be followed and precautions taken to prepare safe and high quality smoked fish.

(10 marks)

**- END OF QUESTION -**

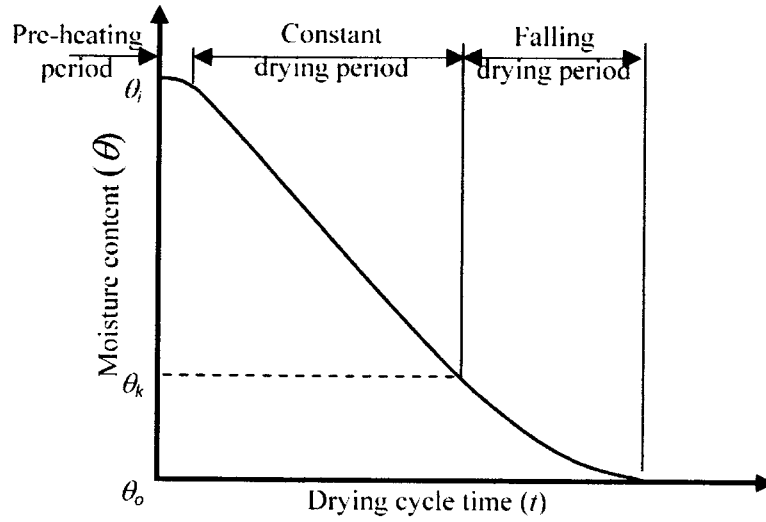
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**Figure Q3 (a)**