



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

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

**COURSE NAME : MILK AND DAIRY PRODUCT TECHNOLOGY**

**COURSE CODE : BWD 40603**

**PROGRAMME : BWD**

**EXAMINATION DATE : DECEMBER 2017 / JANUARY 2018**

**DURATION : 3 HOURS**

**INSTRUCTION : ANSWER ALL QUESTIONS**

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

- Q1** Milk of some animals, especially from cows, buffaloes, goats and sheep, is used for human consumption, either as such or in the form of dairy products.
- (a) Define the meaning of milk. (2 marks)
- (b) The major constituent of milk is water, but according to species, milk contains varying quantity of different components. Draw a schematic diagram of main structural elements of milk. (4 marks)
- (c) Explain how physical changes of raw milk could be occurred during storage. (4 marks)
- (d) Drying is usually applied to make a durable dairy product that is easy to handle and, after reconstitution with water, is very similar in properties to the original material. However, during rapid drying of milk powder manufacturing, a glassy state of milk can be present in a spray dryer which lead to the formation of hard lumps in the product. With your knowledge in dairy chemistry, justify this phenomenon. (10 marks)
- Q2** Separation efficiency is generally the main concern in manufacturing of ~~skim~~ milk.
- (a) Sketch and explain briefly the separation process of raw milk into skim milk. (10 marks)
- (b) Panchor Milk Sdn Bhd has the ability to separate 5500 kg of milk containing 4.5% butterfat in each batch. If they assume there are no significant loses of fat in the cream separator, calculate the expected weight and percentage of cream containing 30% butterfat obtained. (4 marks)
- (c) If in real practice, Panchor Milk Sdn Bhd could obtain only 800 kg of cream in each processing batch, calculate the percentage of butterfat in the skim milk produced by their company for that batch. (6 marks)
- Q3** Pagoh Dairy Sdn Bhd is a manufacturer of dairy beverages. They usually used raw milk as main ingredient. Their customer require that the product shelf life should be more than 14 days without perceptible quality loss and only slightly distinct cooked flavor is developed. Determine the methods that could be considered to apply by Pagoh Dairy Sdn Bhd to fulfill the requirement of their customer. Justify the answer. (20 marks)

**Q4** There are several milk and dairy products in the market, such as liquid milk beverages, milk powder, whipping cream, ice cream, butter, cheese, and etc.

(a) Fatimah has bought a bottle of full cream beverage milk product. Once pour into the glass, she found a layer of cream at the top. Propose a processing step that should be taken by the dairy industry during manufacturing process to avoid the problem. Justify your answer.

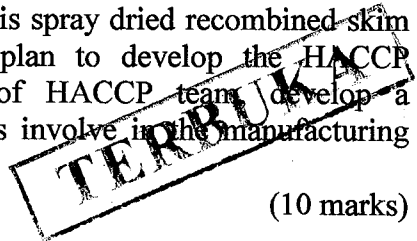
(10 marks)

(b) By using suitable graphic organizer, differentiate between dairy ice cream and sherbet.

(10 marks)

**Q5** The use of Hazard Analysis Critical Control Points (HACCP) system has become a matured food safety system widely used in the international dairy-processing industry.

(a) The only product of Bukit Kepong Dairy Sdn Bhd is spray dried recombined skim milk powder. After two years operation, they plan to develop the HACCP programme for their product. As a member of HACCP team, develop a comprehensive flow diagram that outline the steps involve in the manufacturing process.



(10 marks)

(b) Prior to the developing an HACCP plan, Bukit Kepong Dairy Sdn Bhd have to developed, documented and implemented prerequisite programme (PP) to control factors that may not be directly related to product safety, but serve as a foundation of an HACCP system. By choosing **ONE (1)** prerequisite programme to be implemented, propose a comprehensive monitoring documentation that should be involved.

(10 marks)

- **END OF QUESTIONS** -