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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME : FOOD PROCESSING TECHNOLOGY II
COURSE CODE : BWD 30203
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** Heating is an effective way of preservation in order to reduce the water activity (a_w). Reduction of water activity in food prevents the growth of vegetative microbial cells, germinations of spores and toxin production by molds and bacteria.
- (a) Define and list the **THREE (3)** types of heat transfer. (4 marks)
 - (b) Differentiate between free water, absorbed water and bound water. (6 marks)
 - (c) Outline and relate the basic concepts of thermal destruction of microorganisms. (7 marks)
 - (d) With the aid of the diagram, demonstrate how the autoclave works during sterilization. (8 marks)
- Q2** Drying involves reduction of water content in foods and most commonly used for food preservation. Spray dryer and freeze dryer are the most common drying systems in the food ingredients industry that can be used to speed up the drying process and ensure more consistent results.
- (a) List **TWO (2)** and explain factors affecting of drying process. (9 marks)
 - (b) Sketch and describe how the spray drying work. (8 marks)
 - (c) Compare and contrast between spray drying and freeze drying. (8 marks)
- Q3** Mangoes are abundant during the peak availability months. Therefore, they are processed into various food products to avoid postharvest wastage and allow people to have variety ways of consuming mangoes.
- (a) Salt is used in pickling the mangoes. Show how the salt would assist in preserving the mango pickle. (5 marks)
 - (b) The mango flesh may also be diced into cubes prior to be frozen. The frozen mango cubes will last for a year in a freezer and they can easily be thawed whenever you need them in making smoothies or pie fillings. Cryogenic and spiral freezers may be used to freeze the mango cubes. Give **FIVE (5)** differences between the cryogenic and spiral freezers used in freezing the mango cubes. (10 marks)

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- (c) Fresh-cut mangoes are ready to be eaten in a convenient way. However, they are easily get browning and subsequently reducing its quality. Edible coating is one of the efficient ways to retain the quality of the fresh-cut mangoes if the coating process is done in an appropriate method. Evaluate **FIVE (5)** factors that can be considered in order to give beneficial effects on the edible-coated mango. (10 marks)

Q4 Passion fruit cordial and fish curry sauce are commonly manufactured through evaporation process.

- (a) Analyze why both types of the aforementioned foods have different evaporation rate. (6 marks)
- (b) There are various membrane module configurations used in the food industry. Differentiate between hollow fibre, tubular, spiral wound and flat plate membrane module configurations. (8 marks)
- (c) Propose the best processing method to retain the shelf life of the above-mentioned packaged foods for 24 months at room temperature without adding any preservative. (7 marks)
- (d) Justify why did you choose the processing method as answered in **Q4(c)**. (4 marks)

– END OF QUESTIONS –

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