



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME : FOOD MICROBIOLOGY
COURSE CODE : BWD 10503
PROGRAMME CODE : BWD
EXAMINATION DATE : JUNE/JULY 2018
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

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

- Q1** As more food products are being prepared at central facilities and widely distributed, it is becoming more likely that food might be a source of widespread disease outbreak.
- (a) List **TWO (2)** types of common food hazards. (2 marks)
- (b) Describe the properties of bacteria endotoxin based on the following component;
- (i) Stability (2 marks)
- (ii) Antigenicity (2 marks)
- (iii) Toxicity (2 marks)
- (c) Tabulate the comparison of the hazard effects from the presence of *Clostridium perfringens* and *Clostridium botulinum* in food sources. (12 marks)
- Q2** Synergistic mechanism has been used as the hurdle technology in the food preservation process.
- (a) Define the term “hurdle technology”. (2 marks)
- (b) Identify the microbes’ species and their spoilage features in unpasteurized milk and white bread. (6 marks)
- (c) Analyze and discuss **SIX (6)** ingredients that may give the significant effects on preservation and storage of product XYZ as shown in Figure Q2(c). (12 marks)
- Q3** In the late of 19th century, microbes used in food production were grown in pure culture. This development quickly led to an improved understanding of the relationships between specific microbes and their products and activities.
- (a) State the principal acid producer for “Cammerbert”. (2 marks)
- (b) Explain briefly the main role of “scavenging” organism in fermentation process. (2 marks)
- (c) Compare and contrast the process of making “kimchi” and “Greek” yogurt. (16 marks)

- Q4** Fermentations add value to foods by producing flavor compounds and carbonation, altering texture, and increasing nutrient availability.
- (a) Illustrate and discuss the fermentation process involves in beer production. (10 marks)
- (b) Correlate the biochemical foundation in fermentation process and their implication in food production (10 marks)
- Q5** Microbes have always been exceedingly useful to humankind. They will remain as an essential part of many basic food-processing technologies.
- (a) Recommend and discuss a product which uses one or combination of *Lactobacillus delbrueckii* subsp *bulgaricus*, *Streptococcus thermophilus*, *Lactobacillus acidophilus* and *Bifidobacterium* spp. (10 marks)
- (b) Ah Keong stores imported mutton stock in the refrigerator to maintain the freshness prior to be transported to shops and markets.
- (i) Evaluate the method used by Ah Keong. (4 marks)
- (ii) Suggest ONE (1) other method that may be better for improving the quality of the product. (6 marks)

-END OF QUESTIONS-

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Product XYZ

INGREDIENTS: Enriched flour (*wheat flour, niacin, reduced iron, thiamin mononitrate (vitamin B1), riboflavin (vitamin B2), folic acid*), water, vegetable oil, sodium nitrate, (*soybean oil, palm oil and palm kernel oil*), eggs, leavening (*baking soda, sodium aluminum phosphate, monocalcium phosphate*), sugar, contains 2% or less salt, egg, milk, isoascorbate, calcium carbonate, whey, soy lecithin, vitamin A palmitate, niacinamide, reduced iron, pyridoxine hydrochloride (Vitamin B₆), riboflavin (vitamin B₂), yellow #6 and vitamin B₁₂.

*This product contains: Eggs, Milk and Traces of nuts.

Figure Q2(c): The ingredients of product XYZ

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