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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME : FOOD BIOCHEMISTRY
COURSE CODE : BWD 20103
PROGRAMME : 2BWD
EXAMINATION DATE : DECEMBER 2014/JANUARY 2015
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL **FIVE (5)** QUESTIONS

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

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Q1 (a) Enumerate **five (5)** types of food composition data.

(5 marks)

(b) Enumerate **five (5)** enzymes that are produced during the process of fruit ripening.

(5 marks)

(c) Plant cells are still alive even few weeks after harvesting. As such cells continue to metabolize (protein, lipid and carbohydrate metabolism). Choose any **five (5)** terms listed below and briefly explain their relation to the process of metabolism.

- | | |
|------------------------|--------------------|
| 1. Abscission | 2. Transpiration |
| 3. Protein degradation | 4. Gibberellin |
| 5. Epinasty | 6. Cold shortening |
| 7. Ethylene | 8. Glycolysis |
| 9. Maturity process | 10. Tenderization |
| 11. Respiration | 12. Collagen |
| 13. Ripening | 14. Exsanguination |
| 15. Senescence | |

(10 marks)

Q2 (a) Milk spoilage can be detected visually by the presence of coagulated curd. Explain the chemical mechanisms responsible for such coagulation and how this spoilage differs from those of a home-made cheese.

(5 marks)

(b) Due to the health problems associated with trans fats, the food industry has come up with an innovative solution, a process called enzymatic interesterification. Describe the process involved in this innovative solution.

(5 marks)

- (c) The freshness of meat is one of the important qualities that consumers look for in meat products. Explain how the freshness of meat is judged in terms of physical attributes. What is/are the main characteristic(s) to look for in fresh meat?

(5 marks)

- (d) During postharvest handling and storage, fresh fruits and vegetables lose moisture through their skins via the transpiration process. Commodity deterioration, such as shriveling or impaired flavor, may result if moisture loss is high. Provide **five (5)** practical solutions appropriate in order to minimize losses due to transpiration.

(5 marks)

- Q3** Enzymatic browning is one of the most important colour reactions that affect fruits, vegetables and seafood. Compare the importance of enzymatic browning in fruits and vegetables and aquatic food in terms of economic benefits and losses.

(20 marks)

- Q4** Nowadays, foods are being processed mainly for convenience, efficiency and economics. Some foods are processed minimally and some are processed more than the others. Some are highly processed that the food can no longer provide any nutrients for our bodies' growth and development. Outline the different techniques used in food processing and describe the implications of these processing methods on the nutritional components of the food.

(20 marks)

- Q5** (a) Quality products for consumers are basically produced in the fields, but the quality of these products are maintained and even enhanced during the post-harvest period. Describe **two (2)** important post-harvest innovations related to manipulation of the environment around the produce.

(5 marks)

- (b) Antioxidants protect cells from oxidative damage and some of them are proven potent bone protectors as well. Hence it is a great idea to have your morning breakfast cereal with healthy antioxidants. However, there is always chance that even health food products may not be as they claimed to be. Take a look at the ingredients of a breakfast cereal presented below which claims to contain strong heart antioxidants. Discriminate from the list **two (2)** ingredients of the breakfast cereal which make them unhealthy grab for breakfast.

Ingredients: Rice, whole grain wheat, sugar, oat clusters, sugar, toasted oats [rolled oats, sugar, canola oil with TBHQ and citric acid to preserve freshness, molasses, honey, BHT for freshness, soy lecithin], wheat flakes, crisp rice [rice, sugar, malt, salt], corn syrup, polydextrose, honey, cinnamon, BHT [preservative], artificial vanilla flavor, high fructose corn syrup (HFCS), salt, honey, malt flavoring, alpha tocopherol acetate [vitamin E], niacinamide, zinc oxide, reduced iron, sodium ascorbate and ascorbic acid (vitamin C), calcium pantothenate, Yellow #5, pyridoxine hydrochloride (vitamin B6), riboflavin (vitamin B2), thiamin hydrochloride (vitamin B1), BHT (preservative), vitamin A palmitate, folic acid, beta carotene (a source of vitamin A), vitamin B12 and vitamin D.

(5 marks)

- (c) In food industry, enzyme has been used to produce and to increase the quality and the diversity of food. In addition, enzymes offer potential for many exciting applications for the improvement of foods. Differentiate the major enzymes according to their application in food industry

(10 marks)

END OF QUESTION