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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2015/2016**

COURSE NAME : WATER AND FOOD WASTE
MANAGEMENT

COURSE CODE : BWD 40102

PROGRAMME : 4 BWD

EXAMINATION DATE : DECEMBER 2015/JANUARY 2016

DURATION : 3 HOURS

INSTRUCTION : ANSWER ALL QUESTIONS

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

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Q1 Improperly disposing of wastes has huge environmental impacts and can cause serious problems to human health. Therefore, providing sustainable and safe waste management methods have become a major task to authorities.

(a) Give **FOUR (4)** basic waste management principles (4 marks)

(b) Explain briefly how each one of these principles is useful in sustainable waste management (6 marks)

Q2 Food losses represent a waste of resources used in production such as land, water, energy and inputs. Producing food that will not be consumed leads to unnecessary CO₂ emissions in addition to loss of economic value of the food produced

Choose **TWO (2)** causes of food losses and wastage enumerated below and propose **FIVE (5)** preventive measures, accordingly.

- (i) Unsafe food (due to processing in the production level that is not fit for human consumption cause wasted
 - (ii) Disposing of is cheaper than ‘using’ or ‘re-using’ attitude of most individuals leads to food wastage
 - (iii) Lack of processing facilities causes high food losses in developing countries
 - (iv) High ‘quality standards’ for supermarkets on fresh products lead to food waste
 - (v) Poor storage facilities cause post-harvest food losses
- (10 marks)

Q3 Waste is part of the economy as it is a by-product of economic activity, by businesses, government, and households. Likewise, waste is an input to economic activity - whether through material or energy recovery.

(a) (i) Identify **TWO (2)** activities wherein waste can contribute to economic input through material recovery (2 marks)

(ii) Describe the activities identified in **Q3 (a)(i)** (8 marks)

(iii) Explain the advantages or disadvantages of these activities to human health and environment (10 marks)

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- (b) (i) Identify **TWO (2)** activities wherein waste can contribute to economic input through energy recovery. (2 marks)
- (ii) Describe the activities identified in **Q3 (b)(i)** (8 marks)
- (iii) Explain the advantages or disadvantages of these activities to human health and environment (10 marks)

Q4 Biological treatment is a more natural wastewater treatment process than other wastewater treatment methods. This treatment process employs microorganisms to feed on the complex materials present in the wastewater and turn them into simpler substances, preparing the water for further treatment.

- (a) Identify **FIVE (5)** biological treatment technologies that have been successfully applied in wastewater and explain the process involved in each treatment technology (20 marks)

Q5 You have been made responsible for reviewing a food processing company's waste production and disposal.

- (a) Explain how you would go about identifying the sources of waste in the company. (5 marks)
- (b) Explain how you would determine whether certain types of waste constitute a significant environmental aspect in the community. (5 marks)
- (c) Summarize the environmental impacts associated with waste disposal in the food industry (10 marks)

- END OF QUESTION -