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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME : SOLID AND HAZARDOUS WASTE
MANAGEMENT

COURSE CODE : BFA 40303

PROGRAMME : BFF

EXAMINATION DATE : DECEMBER 2019 / JANUARY 2020

DURATION : 3 HOURS

INSTRUCTIONS : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

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TERBUKA

- Q1** (a) Explain **FOUR (4)** control tasks of Integrated Solid Waste Management (ISWM) to Zero Waste Approach. (4 marks)
- (b) Compare between solid waste and hazardous waste. (6 marks)
- (c) **Table Q1(c)** shows the estimation of municipal solid waste generated by states. Based on the table, predict the municipal solid waste generates by states in 2020 and explain why there are huge different of municipal solid waste generated between Pahang and Johor. (10 marks)
- Q2** (a) Labour and technological issues can create problems in waste collection management. Determine **FOUR (4)** issues of these aspects. (8 marks)
- (b) Justify with the reasons, types of waste that can be separated at source. (4 marks)
- (c) Recommend the economical method of energy recovery waste for food waste and explain the benefits of the method. (8 marks)
- Q3** (a) Identify **TWO (2)** characteristics of hazardous waste. (2 marks)
- (b) Compare between physical/chemical and biological process of leachate treatment. (7 marks)
- (c) Design and explain with illustration of the leachate collection facilities based on sloped terraces and piped bottom. (11 marks)

- Q4** (a) Define hazardous waste. (2 marks)
- (b) Compare the effectiveness of **FOUR (4)** hazardous waste treatment technologies according to its priority in handling organic hazardous waste management. (8 marks)
- (c) A consultant who has sufficient experience in designing solid waste landfill has decided to use the similar design for landfill that contains hazardous waste. Evaluate on the chances of success or failure of the particular design. (10 marks)
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- Q5** (a) Explain **TWO (2)** laws and regulations that is important in hazardous waste management. (4 marks)
- (b) Justify **THREE (3)** importance of the Emergency Response Plan (ERP) by giving sufficient argument. (6 marks)
- (c) Remedial technologies focus to minimize or eliminate the hazard to human health and the environment.
- (i) Compare between passive and active remediation systems. (6 marks)
- (ii) Recommend and explain briefly **TWO (2)** examples for each remediation system. (4 marks)

- END OF QUESTIONS -

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Table Q1(c): Estimation of municipal solid waste generated by states

State	2010	2015
Pahang	250	270
Johor	1395	1590