



UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2021/2022**

COURSE NAME : WASTE MANAGEMENT

COURSE CODE : DAU 22102

PROGRAMME CODE : DAU

EXAMINATION DATE : JULY 2022

DURATION : 2 HOURS

INSTRUCTION : 1. ANSWER **ALL** QUESTIONS.
2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**.
3. STUDENTS ARE **PROHIBITED** TO REFER THEIR MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.

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

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- Q1** (a) Describe the followings:
- (i) waste and its physical state (2 marks)
 - (ii) biodegradable and non-biodegradable waste (2 marks)
- (b) (i) List **three (3)** sources of waste that need special management. (3 marks)
- (ii) Describe the reasons why the wastes in **Q1(b)(i)** are classified as special waste. (6 marks)
- (c) Poor management of waste will affect social health and the environment. Justify this statement. (12 marks)
- Q2** (a) Give the main general purpose of waste management. (2 marks)
- (b) (i) State the name of the organization that is responsible for solid waste management in Malaysia and its main role. (3 marks)
- (ii) Discuss all elements in solid waste management. (12 marks)
- (iii) Onsite storage is one of the important elements of solid waste. State the guidance to follow about the duration to keep waste in the waste generator location. (3 marks)
- (c) There are a few types of containers for waste storage. Identify **five (5)** characteristics of storage waste containers for residential areas. (5 marks)
- Q3** (a) Waste to energy is a technology used in various developed countries.
- (i) State the purpose of this technology. (2 marks)
 - (ii) Give **three (3)** types of energy produced by this technology. (3 marks)

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- (b) A landfill is a site for the final disposal of solid waste materials. Answer the following questions.
- (i) Discuss all essential elements that are required for sanitary landfill structure. (5 marks)
- (ii) Explain the similarities between sanitary and inert landfills. (5 marks)
- (c) Incineration is a waste treatment process that contributes to environmental sustainability. However, this process has also bad effects. Justify the **five (5)** advantages and disadvantages of the incineration process for final waste disposal. (10 marks)

- Q4** (a) Explain the importance of industrial waste management. (3 marks)
- (b) “A total of 9.28 million tons of fresh fruit bunch (FFB) were processed in 2020 and resulted in a total of 5.57 million tons of palm oil mill effluent (POME) for all plants in Sime Darby Plantation Malaysia. Other than POME, the solid wastes were also produced.”
- (i) Based on the above statement, identify all wastes produced from the palm oil mill industry. (3 marks)
- (ii) Justify the processes that contribute to waste production in the palm oil mill industry. (10 marks)
- (c) The palm oil mill industry must carry out a treatment process for palm oil mill effluent (POME) before discharging the effluent into the river.
- (i) Explain the objectives to treat POME. (2 marks)
- (ii) Wastewater can be treated by physical, chemical, and biological methods. Propose the treatment methods for POME. (7 marks)

- END OF QUESTIONS -

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