First Semester Examination
2021/2022 Academic Session

February/March 2022

EAP415 – Solid Waste Management

Duration : 1 hour

Please ensure that this examination paper contains **THREE (3)** printed pages before you begin the examination.

Instructions: This paper contains **THREE (3)** questions. Answer **TWO** questions.

All questions **MUST BE** answered on a new page.

1. (a). Solid wastes generation rate is affected by several factors. With a suitable example, discuss **FIVE (5)** of these factors.

[10 marks]

(b). Design Village is an outlet mall in Batu Kawan, Penang, Malaysia. Opened in 2016, it is Malaysia's biggest outlet mall, spanning a built-up area of 37,161 m^2 and has 300-unit stores. If the average daily solid waste generation rate is 150 kg per store and the waste collection is scheduled 3 times per week, compute the number of storage container required to be supplied. (Standard container size is 120 liter with utility rate of 75%. Assume waste density is 125 kg/m^3).

[15 marks]

2. (a). There are four levels of sanitary landfill practices in Malaysia. Describe the **FIVE (5)** criteria required for the development of a sanitary landfill site.

[10 marks]

(b). Kedah Aerotropolis is new township with a population of 25000. It generates solid waste at a rate of 1.2 kg/capita-day. A new landfill will be constructed at a maximum of 20-meter height. If the waste can be compacted to 800 kg/m^3 and the ratio of solid waste to soil cover is 1:4, and landfill lifespan is 15 years, compute the required area (in hectare) of the landfill.

[15 marks]

...3/-

3. (a). Grass with a C/N ratio of 45:1 is to be blended with waste-activated sludge from a sewage treatment plant, with a C/N ratio of 6.3:1. Determine the proportions of each component to achieve a blended C/N ratio of 28:1. Assume that the following conditions are applied:

- Moisture content of sludge = 83%
- Moisture content of leaves = 60%
- Nitrogen content of sludge = 6.1%
- Nitrogen content of leaves = 0.7%

[16 marks]

(b). From Question 3(a), identify the component that does not meet the required main operating conditions in the composting process. Provide solution that can help to solve the problem.

[9 marks]

-oooOOOooo-