

SULIT



Second Semester Examination
2020/2021 Academic Session

July/August 2021

EAL339 – Sustainable Transport

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 **ALL** questions.

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

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1. (a). Non-petroleum alternatives have become more common due to concern over depletion of natural resources, emissions, and climate change, as well as fluctuation of crude-oil price. That has contributed to the development of more environmentally friendly and non-toxic alternatives to bio-asphalt. Based on that situation:

i) List **TEN (10)** types of material that can be used to produce bio-asphalt.

[10 Marks]

ii) With the aid of diagram, explain the process used to produce bio-asphalt. Elaborate **TWO (2)** factors that make the bio-asphalt is greener than the conventional asphalt.

[16 Marks]

(b). Porous asphalt pavement is specifically designed with air voids more than 20%. This type of pavement technology can be divided into single layer porous asphalt and two-layer porous asphalt.

i) With the aid of sketches, explain **FOUR (4)** concepts behind the development of the two-layer porous asphalt.

[10 Marks]

ii) The traditional Marshall method of mix design cannot be used to determine the optimum binder content (OBC) of a porous asphalt mixture. Discuss **TWO (2)** main reasons, and elaborate **TWO (2)** tests that can be used to determine the OBC of a porous asphalt mixture.

[14 Marks]

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2. (a). Sustainable transport emphasizes the use of public transport, bicycles as well as walking and discourages the use of individual motorized modes of transport. Explain **FIVE (5)** positive impacts of sustainable mobility policies as listed below. Suggest **FIVE (5)** criteria of each policy that are suitable to be implemented in Malaysia.

- i) Pedestrian Oriented Development.
- ii) Transit Oriented Development

[20 marks]

3. (a). Explain briefly **SIX (6)** indicators for sustainable transport, according to the Sustainable Development Goals 11 (SDG 11).

[12 marks]

- (b). City Y has 6.1 million vehicles, mostly cars and motorcycles. There is no action has been taken to control air pollution over the past decade with most of the commercial vehicles are operated more than 10-year-old. Sustainable transport strategy is clearly needed to be implemented in this city. Identify one sustainability goal for each element of environment, economy, and society for this city. Define the objectives of the goals and construct the suitable performance indicator for each goal to control air pollution from transportation.

[18 marks]

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