

**SULIT**

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Second Semester Examination  
2021/2022 Academic Session

July/August 2022

**EAL339 – Sustainable Transport**

Duration : 1 hour

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Please ensure that this examination paper contains **FOUR (4)** 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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**SULIT**

1. (a) The pavement structural layer is a very important element in pavement design prior to ensuring adequate long-term pavement performance. Considering the current issues with regards to cost fluctuation of raw materials, energy-saving protocols, the carbon footprint associated with material production, and the need for waste recycling, you are asked to provide **FOUR (4)** technologies that could be taken into consideration for sustainable pavement materials. Describe **THREE (3)** principles for each selected technology in sustainable asphalt.

[18 marks]

- (b) Porous asphalt is typically used to reduce traffic noise. Initially, it was designed to provide safer roads. Explain **FOUR (4)** factors that can make porous asphalt pavement significantly improve road safety. Provide sketches to support your explanation.

[12 Marks]

- (c) With the aid of sketches, explain **TWO (2)** differences between conventional asphalt pavement and perpetual pavement.

[10 Marks]

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2. (a) Infrastructure and facilities for walking received little attention in the planning, design, and development of communities in urban cities. The authorities are also not focusing enough on land use planning, zoning, site plan and street design for walkable communities. Discuss **FIVE (5)** benefits from encouraging walkable communities in the sustainable development planning of an urban city. Provide an example for each benefit.

[20 marks]

- (b) There are many types of crosswalk marking patterns, and high visibility markings are suggested for locations with high pedestrian crossing volumes. With the aid of suitable sketches, differentiate **FIVE (5)** crosswalk marking patterns. State the advantages and disadvantages of each crosswalk pattern.

[10 marks]

3. After two years of the COVID-19 pandemic, the transport and mobility scene has seen significant changes in the supply and demand, which have influenced the travel behaviour and trip patterns that may influence sustainable transport.

(a) State **THREE (3)** changes to sustainable transport during the peak of the pandemic when travelling was restricted, lockdowns were imposed, and when country borders were closed. Provide examples of the changes, and argue whether they had given positive or negative implications to sustainable transport, and how will they affect the relevant sustainable development goals (SDG).

[15 marks]

(b) Now that the world is going into the endemic stage, provide **TWO (2)** scenarios that you expect will happen and how will they affect sustainable transport.

[10 marks]

(c) Suggest **TWO (2)** recommendations to ensure that the aspirations of sustainable transport are maintained and to be achieved.

[5 marks]

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