



First Semester Examination
Academic Session 2021/2022

February/March 2022

EAP584 – Environmental Impact Assessment

Duration : 2 hours

Please ensure that this examination paper contains **FIVE (5)** printed pages before you begin the examination.

Instructions: This paper contains **FIVE (5)** questions. Answer **FOUR** questions.

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

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- (1). Both EIA and ERA are structured tools leading to recommendations concerning the environment that can assist decision makers.

Compare **SIX (6)** iterative process of framework between EIA and ERA.

[25 marks]

- (2). (a). Environmental monitoring is one of the important requirements in the Environmental Management Plan (EMP). Discuss **THREE (3)** categories of environmental monitoring.

[9 marks]

- (b). A project for the development of a scheduled waste thermal treatment plant will be developed in Papar, Sabah. This plant will facilitate the transportation, storage and treatment of scheduled waste collected from public and private healthcare facilities in Sabah and the federal territory of Labuan with the capacity of 360 tons per month of waste. The proposed site for this project with an area of 4.35 acres of land is located in the countryside of Sabah.

Important environmental conditions to consider:

- Project site is vacant undeveloped land located beside the existing solid waste disposal site.
- The nearest residential area is approximately 1.4 km away in the east named Kampung Langka. Another 4 – 5 residential areas are located between 2 – 5 km from the site.
- There is a river 1 km away from the site flowing directly to the sea.
- The sea is not within the zone of impact.

From the above project, propose pollution prevention and mitigation measures (P2M2) with best management practice (BMP) for air quality, water and wastewater quality and noise quality

[16 marks]

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- (3). (a). You are given a project to assess the traffic impact surrounding a proposed development which is located nearby the USM Engineering Campus as shown in **Figure 1**. The proposed development is a mixed-development and consists of 50% residential area and 50% commercial area. The proposed development is expected to be completed by the year 2035. Discuss in detail the followings;

- (i). Expected impact of the mixed development in a traffic impact assessment (TIA) study.

[10 marks]

- (ii). Importance of TIA studies in maintaining a sustainable development.

[5 marks]



Figure 1: Location of proposed development

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- (b). Mixed traffic composition is one of the main causes of road accidents. Motorcyclists contribute a significant percentage of road accidents in Malaysia. Discuss **FIVE (5)** strategies that can be implemented to reduce the risks of motorcyclist risky riding behaviour.

[10 marks]

- (4). (a). Sediment yield is subjected to the occurrence and magnitude of surface runoff. Discuss **FIVE (5)** factors that influence the magnitude and rate of surface runoff.

[10 marks]

- (b). The site of a project has the following conditions:

- Project area is 500 acres.
- The ground has silty clay soil – infiltration less than 25 mm/hr.
- Slope between 10% to 20% - more than 50% of the area.
- Groundwater table is more than 2 m below the ground surface.
- Elevation difference between building platform and downstream outlet is more than 10 m.
- Contract of the project consists of an infrastructure package and five building satellite packages.

Propose ESCP for sediment control and erosion control in the project to comply with DOE requirement of 100 mg/L. The train of treatment from every Satellite Package shall consist of 5 devices (minimum) for sediment control. The discussions shall include the concept, function and effectiveness of the device used in the train of treatment.

[15 marks]

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- (5). Remote sensing is known as acquiring information through observation about an object or phenomenon without making any physical contact with the object. Usage of remote sensing technology and spatial data in Environmental Impact Assessment (EIA) is one advancement in reporting and analysis that may assist engineers and managers in determining the risk and impact of the development from an environmental perspective.

- (a). Using a sketch, explain the different remote sensing segments.

[5 marks]

- (b). Unmanned Aerial Vehicle (UAV) platforms, sensors, and image processing techniques have resulted in an increased uptake of this technology in the remote sensing science community.

- (i). Explain the differences between the common remote sensing technology and UAV.
- (ii). Describe the advantages and disadvantages of using UAV
- (iii). Explain how UAV can help to improve data acquisition and contribute to advancement in remote sensing technologies.

[8 marks]

- (c). GIS is used in EIA for all three main stages: data preparation, modelling, and result presentation. You are appointed as one of the engineers tasked to complete the EIA report for a landfill development at your location. Explain with justification the use of spatial information (as part of GIS practice) in one of the stages mentioned using a suitable framework to assist the analysis and reporting in the EIA report.

[12 marks]

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