



**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2022/2023**

COURSE NAME : GEOENVIRONMENTAL ENGINEERING  
COURSE CODE : BFG 40303  
PROGRAMME CODE : BFF  
EXAMINATION DATE : FEBRUARY 2023  
DURATION : 3 HOURS  
INSTRUCTION : 1. ANSWER ALL QUESTIONS.  
2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK**.  
3. STUDENTS ARE **PHOHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.

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

- Q1** (a) Explain **FIVE (5)** core areas of the environmental management process. (5 marks)
- (b) Classify the contamination types that are harmful to humans and give effect toward water, air and land and list types of heavy metal. (8 marks)
- (c) Natural degradation of huge amounts of crude oil takes its own time. However, as long as the oil continues to float over the water surface, it harms the aquatic life and as such cleaning up of oil spills becomes very important. Recommend the oil spill cleaning operations to remove the crude oil. (12 marks)
- Q2** (a) Identify the methods to minimize the amount of leachate. (5 marks)
- (b) An oil spill is the release of a liquid petroleum hydrocarbon into the environment due to human activity, and is a form of pollution. The term is usually given to marine oil spills, where oil is released into the ocean or coastal waters, but spills may also occur on land. Oil spills may be due to releases of crude oil from tankers, offshore platforms, drilling rigs and wells, as well as spills of refined petroleum products (such as gasoline, diesel) and their by-products, heavier fuels used by large ships such as bunker fuel, or the spill of any oily refuse or waste oil. Cleanup and recovery from an oil spill is difficult and depends upon many factors, including the type of oil spilled, the temperature of the water (affecting evaporation and biodegradation), and the types of shorelines and beaches involved. Verify the spill management based on 3C concept (Control, Contain and Clean Up). (20 marks)
- Q3** (a) Classify **TWO (2)** main ways of pollution transfer from one medium to another medium. (4 marks)
- (b) Distinguish **FOUR (4)** types of pollutants for soil-water interaction. (8 marks)

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- (c) During the last five or six decades an increasing amount of trace element including heavy metals such as arsenic, cadmium, mercury and chromium have been discharged into the environment by industrial establishment, transport activities and power generation units etc. Predict what could happen to human health if surrounded by these elements.

(13 marks)

- Q4** (a) Categorize **THREE (3)** physical processes which affect the flow of solute (contaminants) in groundwater.

(7 marks)

- (b) Sketch the optimal characterization to identify and establish the potential and optimal solution for remediation through a flow chart.

(5 marks)

- (c) The contaminations of heavy metals have been found at Jaya Area. Plan **FOUR (4)** site investigation method to determine the subsurface underground in order to obtain the relevant parameters.

(8 marks)

- (d) Significant asbestos contamination was identified at Campbell Section 1 and company has been prepared to cut the expenses to remedial that area. Propose the phases of site work for the remedial plan should be done to remove the asbestos.

(5 marks)

**-END OF QUESTIONS -**

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