



UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF CHEMICAL & BIOENGINEERING TECHNOLOGY

FINAL EXAMINATION
OCTOBER 2025 SEMESTER

COURSE CODE	: CED 22203
COURSE NAME	: INTRODUCTION TO ENVIRONMENTAL ENGINEERING TECHNOLOGY
PROGRAMME NAME (FOR MPU: PROGRAMME LEVEL)	: DIPLOMA
DATE	: 03 FEBRUARY 2026
TIME	: 09.00 AM – 12.00 PM
DURATION	: 3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please **CAREFULLY** read the instructions given in the question paper.
2. This question paper has information printed on both sides of the paper.
3. This question paper consists of **TWO (2)** sections; Section A and Section B.
4. Answer **ALL** questions in Section A. For Section B, answer **THREE (3)** questions **ONLY**.
5. Please write your answers on the OMR answer script and answer booklet provided.
6. Answer all questions in English language **ONLY**.

SECTION A (Total: 25 marks)**INSTRUCTION: Answer ALL questions.****Please use the objective answer sheet (OMR) provided.**

1. Determine the main focus of Environmental Engineering Technology.
 - A. Economic development
 - B. Environmental protection and improvement
 - C. Mechanical system design
 - D. Computer programming

2. Define sustainability.
 - A. Using all available resources
 - B. Meeting present needs without compromising future generations
 - C. Preventing all development
 - D. Maximizing profit

3. Describe the main role of an Environmental Engineering Technologist
 - A. Managing company finances
 - B. Applying technical skills to solve environmental problems
 - C. Drafting environmental laws
 - D. Conducting social surveys

4. Identify how pollution control contributes to environmental sustainability
 - A. By increasing waste generation
 - B. By eliminating all industrial activities
 - C. By reducing harmful emissions to air, water, and soil
 - D. By encouraging resource exploitation

5. How does the Environmental Quality Act 1974 support sustainable development in Malaysia?
 - A. By encouraging unrestricted industrial growth
 - B. By providing guidelines without enforcement
 - C. By regulating pollution and ensuring environmental protection
 - D. By focusing only on economic growth

6. Which term refers to a community of living organisms interacting with non-living components?
- A. Ecology
 - B. Ecosystem
 - C. Biosphere
 - D. Habitat
7. Identify the abiotic factor in an ecosystem.
- A. Producer
 - B. Consumer
 - C. Decomposer
 - D. Sunlight.
8. Explain the importance of producers in an ecosystem.
- A. They consume other organisms
 - B. They recycle nutrients directly
 - C. They convert sunlight into chemical energy
 - D. They control population size
9. Determine the most likely environmental impact of a sudden increase in SO_2 emissions from a power plant.
- A. Global warming
 - B. Eutrophication
 - C. Acid rain formation
 - D. Water scarcity
10. Urbanization reduces infiltration and increases surface runoff. Which cycle is MOST directly affected?
- A. Carbon cycle
 - B. Nitrogen cycle
 - C. Phosphorus cycle
 - D. Water cycle

11. Identify the parameter included in the Water Quality Index (WQI)
 - A. Turbidity
 - B. Dissolved Oxygen (DO)
 - C. Temperature
 - D. Colour

12. Why is water quality evaluated based on its intended use?
 - A. Water quality is the same for all purposes
 - B. Different uses require different water quality standards
 - C. Only drinking water requires standards
 - D. Water quality changes daily

13. Explain why non-point sources of water pollution are difficult to control.
 - A. They come from a single discharge pipe
 - B. They are easy to monitor
 - C. They originate from diffuse and widespread activities
 - D. They contain no pollutants

14. How does high turbidity affect drinking water quality?
 - A. Improves disinfection efficiency
 - B. Shields microorganisms from disinfectants
 - C. Reduces water temperature
 - D. Increases dissolved oxygen

15. Determine the factor that cause the formation of smog.
 - A. Dust storms only
 - B. Smoke mixed with rain
 - C. A mixture of air pollutants and sunlight
 - D. Fog without pollutants

16. How do meteorological factors influence air pollution levels?
 - A. They change the chemical composition of pollutants
 - B. They determine how pollutants disperse and accumulate in the atmosphere
 - C. They remove all air pollutants
 - D. They increase pollutant emissions

17. A factory releases pollutants through a tall stack at a constant rate under steady wind conditions. Which model is MOST suitable to estimate ground-level concentration?
- A. Water balance model
 - B. Gaussian Plume Model
 - C. Hydrologic cycle model
 - D. Noise prediction model
18. Which air pollution control device is MOST effective for removing particulate matter from exhaust gases?
- A. Bag filter
 - B. Noise barrier
 - C. Wind vane
 - D. Ozone generator
19. A construction site is located near a school. Which action is MOST appropriate to reduce noise pollution?
- A. Increase working hours
 - B. Schedule noisy activities during examination periods
 - C. Install noise barriers and maintain equipment
 - D. Ignore complaints from the public
20. Why are children and elderly people more vulnerable to air pollution?
- A. They spend less time outdoors
 - B. Their respiratory systems are more sensitive or already weakened
 - C. They are exposed to fewer pollutants
 - D. They have stronger immunity
21. Define soil pollution.
- A. Natural variation in soil composition
 - B. Accumulation of harmful substances in soil that pose risks to health and the environment
 - C. Loss of soil nutrients due to erosion
 - D. Excessive use of fertilizers only

22. Which soil component has the finest particle size and highest water retention?
- A. Sand
 - B. Silt
 - C. Clay
 - D. Gravel
23. How does organic matter influence soil quality?
- A. It reduces microbial activity
 - B. It decreases water-holding capacity
 - C. It improves fertility and supports microbial processes
 - D. It increases soil erosion
24. Why is contaminant transformation in soil environmentally significant?
- A. It has no effect on pollution control
 - B. It can reduce toxicity or form more harmful by-products
 - C. It prevents contaminants from moving
 - D. It eliminates the need for remediation
25. Determine the legislation that primarily governs soil protection and the management of contaminated land in Malaysia.
- A. Standards of Malaysia Act 1996
 - B. Environmental Quality (Industrial Effluent) Regulations 2009
 - C. Environmental Quality Act 1974
 - D. National Water Services Commission Act

SECTION B (Total: 75 marks)

INSTRUCTION: Answer THREE (3) questions ONLY.

Please use the loose paper provided.

Question 1

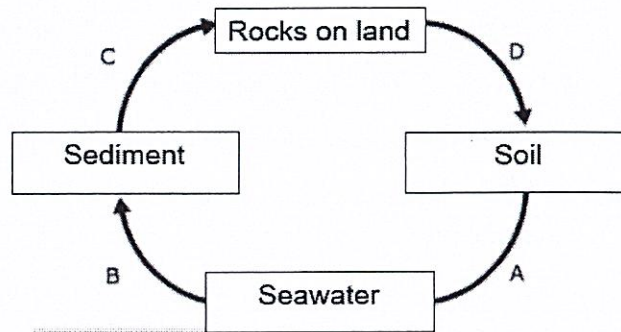


Figure 1: Phosphorus cycle in an ecosystem.

- a) Define the following terms
- i. Ecosystem
 - ii. Ecology
 - iii. Biogeochemical cycle
- (3 marks)
- b) Describe TWO (2) types of ecosystems.
- (4 marks)
- c) Name the processes that occur at points A, B, C, and D in the phosphorus cycle shown in **Figure 1**.
- (8 marks)
- d) List out FIVE (5) effects of excessive use of phosphate fertilizers on the phosphorus cycle and aquatic ecosystems.
- (10 marks)

Question 2

Table 1: BOD₅ test data for the sample collected from Sg. Linggi

Bottle	Sample (mL)	DO initial (mg/L)	DO final (mg/L)	DO depletion (mg/L)
1	4	7.95	1.26	6.69
2	6	8.21	3.85	4.36
3	3	7.00	0.2	6.8
4	10	9.00	5.2	3.8

Based on **Table 1**, answer all the following questions.

- a) Define Biochemical Oxygen Demand (BOD).
(1 mark)
- b) State TWO (2) reasons why dilution is required in a BOD test.
(2 marks)
- c) List TWO (2) conditions that must be satisfied for a BOD test result to be considered valid.
(2 marks)
- d) Explain what is meant by DO depletion in a BOD test.
(2 marks)
- e) Identify TWO (2) bottles that meet the acceptable DO depletion range for valid BOD determination and justify your answer.
(4 marks)
- f) Identify the bottle(s) that should be excluded from BOD calculation and justify your answer.
(4 marks)
- g) State the formula used for BOD calculation.
(2 marks)
- h) Determine the average BOD₅ for data in **Table 1**.
(8 marks)

Question 3

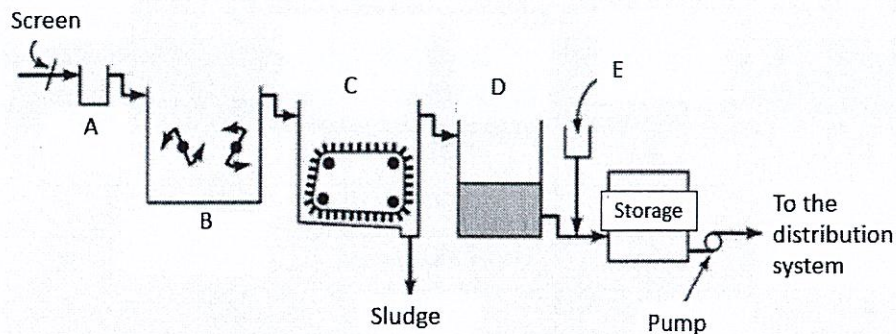


Figure 2: Filtration water treatment plant

Based on **Figure 2**, answer all the following questions.

- a) Define water treatment. (2 marks)
- b) State THREE (3) objectives of treating raw water. (3 marks)
- c) Give FIVE (5) sources of water pollutants. (5 marks)
- d) Name the processes occurring at A, B, C, D, and E. (5 marks)
- e) Explain the role of processes A, B and C. (6 marks)
- f) Explain how filtration and storage ensure safe drinking water. (4 marks)

Question 4

Read the passage below and answer all the questions given.

Taman Bestari is a medium-sized town with a growing population. Every day, municipal solid waste (MSW) is produced from houses, restaurants, offices, schools, and construction sites and is collected by the local authority for disposal. The waste was varied in specific weight, fusing point of ash, organic fraction, particle size, field capacity, energy content, permeability, and calorific value. However, poor waste management practices have led to environmental problems in some areas. In addition to municipal solid waste, some activities in the town generate hazardous waste. Hazardous waste can be dangerous if it is not handled and treated properly. To reduce these problems, the government has introduced laws and regulations related to solid and hazardous waste management. These regulations are enforced by relevant authorities to ensure that waste is managed safely and does not harm humans or the environment.

- a) Describe how population growth in Taman Bestari contributes to an increase in municipal solid waste generation.
(5 marks)
- b) Explain why poor waste management practices can lead to environmental problems in Taman Bestari.
(5 marks)
- c) List FIVE (5) physical characteristics of MSW.
(5 marks)
- d) Give THREE (3) examples of hazardous waste.
(3 marks)
- e) Explain why hazardous waste poses a greater risk to humans and the environment compared to municipal solid waste.
(5 marks)
- f) State the law implemented in Malaysia related to solid and hazardous waste management.
(2 marks)

END OF EXAMINATION PAPER

