

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S8 (R,S)(FT/WP) Examinations April 2026 (2019 Scheme)

Course Code: CET424
Course Name: GEOENVIRONMENTAL ENGINEERING

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions, each carries 3 marks.

Marks

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|----|---|-----|
| 1 | List any three regulatory requirements under the Solid Waste Management Rules by MoEF & CC. | (3) |
| 2 | How does soil act as a natural filter in groundwater protection? | (3) |
| 3 | Define the diffused double layer (DDL) and explain its importance in soil systems. | (3) |
| 4 | What is the significance of Fick's law in contaminant transport? | (3) |
| 5 | What are the advantages and disadvantages of using geomembrane as a liner material? | (3) |
| 6 | Define leachate and its impact on landfill environments. | (3) |
| 7 | Describe the locations and functions of protection layer in a landfill cover system. | (3) |
| 8 | Explain the role of the drainage layer in landfill design. | (3) |
| 9 | What are the key factors considered in risk assessment of contaminated sites? | (3) |
| 10 | What are the common contaminants found in landfill leachate? | (3) |

PART B

Answer any one full question from each module, each carries 14 marks.

Module I

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|----|---|-----|
| 11 | a) Explain geotechnical characterisation of municipal solid waste | (7) |
| | b) Explain the characteristics of hazardous waste? Explain with examples. | (7) |

OR

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| 12 | a) Explain various waste disposal methods and their impact on the environment. | (7) |
| | b) Compare and contrast column percolation and sequential batch-contact testing. | (7) |

Module II

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| 13 | a) Outline the process of site selection for landfill design based on environmental | (7) |
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impact assessment and locational criteria.

- b) Explain soil, water and containment interaction and subsequent effect on geotechnical properties (7)

OR

- 14 a) Compare natural attenuation and containment landfills with a focus on design and environmental impact. (7)
b) Explain various contaminant transport process (7)

Module III

- 15 a) Describe the construction process of a compacted clay liner and the measures to ensure its effectiveness. (7)
b) Discuss the types of geosynthetic materials used in landfill engineering and their respective functions. (7)

OR

- 16 a) Elaborate on the significance of landfill settlement and the challenges in predicting its impact on landfill capacity. (7)
b) Draw a typical layout of a landfill and explain the facilities to be provided (7)

Module IV

- 17 a) Describe the various components of a landfill leachate collection and removal system. (7)
b) Compare different landfill gas extraction methods with their advantages and disadvantages (7)

OR

- 18 a) How does post-closure care ensure long-term environmental sustainability of landfills? (7)
b) Compare and contrast single liner, composite liner, and double liner systems used in landfill construction.. (7)

Module V

- 19 a) Explain bioremediation techniques and their applications in soil. (7)
b) How does the pump and treat method work for groundwater remediation? Discuss its advantages and limitations. (7)

OR

- 20 a) Compare different soil exploration techniques used in contaminated site assessment. (7)
b) Explain electrokinetic remediation of soil (7)
