

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

M.E DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

Second Semester

Environmental Engineering

EV4010 / PEVE2410 Geo-Environmental Engineering

Regulations – 2021/2024

Duration : 3 Hrs

Maximum: 100 Marks

PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

Q.No	Questions	BLT	CO	Marks
1.	What is Geo-Environmental Engineering and why has it emerged as an important field?	L2	1	2
2.	Differentiate between inorganic and organic toxic chemicals with examples.	L2	1	2
3.	Define chemical mass transfer in the context of soil contamination.	L1	2	2
4.	Name any two common sources of groundwater contamination.	L1	2	2
5.	Define contaminated site characterization.	L1	3	2
6.	Differentiate between surface and subsurface drains.	L2	3	2
7.	State one application of electro kinetic remediation.	L3	4	2
8.	What is the purpose of soil fracturing in remediation?	L2	4	2
9.	Differentiate between pump and treat and in-situ flushing.	L2	5	2
10.	Mention any two advantages of bioremediation.	L1	5	2

PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

Q.No	Questions	BLT	CO	Marks
11. a	Explain the emergence of Geo-Environmental Engineering and discuss its significance in modern civil engineering practices.	L1	1	16
	Or			
b	Write short notes on the following: a) Soil permeability and contaminant transport b) Cation exchange capacity c) Sorption and desorption of pollutants d) Soil pH and its environmental implications	L1	1	16
12. a	Discuss the role of biological processes in geo-environmental engineering. Explain how microbes help in the breakdown of contaminants.	L3	2	16

Or

	b	Discuss the environmental and engineering considerations in the design and maintenance of landfills for effective containment.	L3	2	16
13.	a	What is environmental risk assessment? Explain the steps involved and how it guides the selection of a remedial strategy.	L3	3	16
		Or			
	b	Propose a complete remedial strategy for a petroleum-contaminated site, including site investigation, risk assessment, containment, and treatment technologies.	L3	3	16
14.	a	Describe thermal desorption. How does it differ from incineration? Discuss its effectiveness in treating volatile and semi-volatile contaminants.	L2	4	16
		Or			
	b	Explain the role of soil fracturing in enhancing in-situ remediation. How does it improve the performance of other treatment technologies?	L2	4	16
15.	a	What are permeable reactive barriers (PRBs)? Explain their design, working mechanism, reactive materials used, and field applications.	L1	5	16
		Or			
	b	Write a detailed note on bioremediation. Describe types (in-situ and ex-situ), microbial processes involved, and conditions needed for effective treatment.	L1	5	16