Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2024

CIVIL ENGINEERING (ENGLISH MEDIUM) BRANCH

Semester VII

CE5792 – Environmental Remediation Technologies

(Regulation 2019)

Time: 3hrs | Max. Marks: 100

CO1	Explain about the different types of environmental pollutants, their sources, occurrence and distribution in different environmental compartments
CO2	Explain about the impacts of environmental pollutants, existing regulations/policies and factors to be considered for selecting right remediation technology for successful risk-based cleanup of a problematic site
CO3	Select an appropriate physical and/or chemical clean-up option for environments contaminated with different types of pollutants in order to achieve the target remedial endpoints
CO4	Select a suitable bioremediation technology to achieve clean up goals
CO5	Possess a detailed knowledge of the emerging techniques that could successfully overcomes the challenges faced in remediating different groups of contaminants and suit site specific needs

BL – Bloom's Taxonomy Levels

(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

Q. No.	Questions	Marks	CO	BL
1	What do you mean by POPs?	2	CO1	L1
2	List any 4 emerging pollutants.	2	CO1	L2
3	Define the term 'remediation technology'.	2	CO2	L1
4	Differentiate *ex-situ* and *in-situ* remediation.	2	CO2	L2
5	What is incineration?	2	CO3	L3
6	Name 4 chemical oxidants that effectively remove pollutants.	2	CO3	L4
7	Discuss about the applicability of physical barriers.	2	CO4	L3
8	Define phytoremediation.	2	CO4	L4
9	List any 2 disadvantages of using nanomaterials for site cleanup?	2	CO5	L5
10	List 4 integrated remedial strategies for cleaning up polluted soil.	2	CO5	L6

PART- B (5 x 13 = 65 Marks)

Q. No.	Questions	Marks	CO	BL
11 (a)	Write a brief note on any 2 organic pollutants.	13	CO1	L1
	OR			
11 (b)	Briefly explain 2 types of environmental pollution.	13	CO1	L1
12 (a)	Describe 2 in-situ remediation technologies.	13	CO2	L4
	OR			
12 (b)	What is chemical pollution and discuss the options to address their potential risks.	13	CO2	L4
13 (a)	Write a brief note on (a) dig and dump and (b) Air sparging	13	CO3	L2
	OR			

13 (b)	Discuss: (a) Soil washing and (b) Pyrolysis	**13**	CO3	L2
14 (a)	Explain biostimulation and bioaugmentation.	**13**	CO4	L5
	OR			
14 (b)	Discuss: (a) Natural attenuation and (b) Biopiles.	**13**	CO4	L5
15 (a)	Describe about microbial fuel cells.	**13**	CO5	L3
	OR			
15 (b)	Write a note on the use of genetically engineering plants and microbes in environmental remediation.	**13**	CO5	L3

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No.	Questions	Marks	CO	BL
16.	Suggest two sustainable remediation options for a site with both organic and inorganic pollutants. Highlight their applicability, merits, and demerits.	**15**	CO4	L6

ADDITIONAL CONTROLLER OF EXAMINATIONS AU CHENNAI 600 025