Reg. No.															

Question Paper Code	13433

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Seventh Semester

Civil Engineering

20CEEL701 - INDUSTRIAL WASTE WATER TREATMENT

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which industry in India is the largest consumer of water? (a) Textile (b) Agriculture (c) Steel (d) Pharmaceuticals	1	K1	CO1
2.	Which characteristic is commonly analyzed in industrial wastewater? (a) pH (b) Temperature (c) Dissolved Oxygen (DO) (d) All of the above	1	K1	CO1
3.	Equalisation in wastewater treatment primarily serves to: (a) Remove dissolved solids (b) Adjust the pH of the water (c) Even out the flow rate and pollutant concentration (d) Remove oils and greases	1	K2	CO2
4.	What is the common method used for the separation of oil from wastewater? (a) Membrane Filtration (b) Neutralization (c) Oil Separation by Skimming (d) Biological Treatment	1	K1	CO2
5.	Relate the most common industry associated with Zero Effluent Discharge (ZED) systems (a) Textile industry (b) Food processing industry (c) Paper industry (d) Pharmaceutical industry	1	K2	CO3
6.	The environmental impact of RO reject water is primarily due to (a) High temperature (b) High salinity (c) High organic load (d) Low dissolved oxygen	1	K1	CO3
7.	What is the primary goal of industrial wastewater treatment? (a) To remove solid waste (b) To recycle water (c) To reduce pollutants (d) To increase oxygen content	1	K1	CO4
8.	Which of the following characteristics is NOT usually associated with sludge? (a) High organic content (b) High pathogen content (c) Low solid content (d) High thermal stability	1	K1	CO4
9.	Which treatment method is commonly used to remove solid particles from wastewater? (a) Filtration (b) Oxidation (c) Aeration (d) Neutralization	1	K1	CO5
10.	Infer the process of out come from membrane filtration in textile wastewater treatment? (a) To remove large particles (b) To reduce BOD and COD (c) To separate dyes and other dissolved pollutants (d) To adjust pH levels	1	K2	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	How does the waste water impact the overall industrial scenario?	2	K1	CO1
12.	Summarize the major environmental impacts of untreated industrial wastewaters.	2	K2	CO1
13.	Explain the purpose of equalization in wastewater treatment, and how does it affect subsequent treatment processes.	2	K2	CO2
14.	How does chemical precipitation help in the removal of heavy metals from wastewater?	2	K1	CO2
15.	Summarize the factors to be considered when determining the method of wastewater disposal on land.	2	K2	CO3
16.	Contrast the quality requirements for wastewater reuse between agricultural and industrial applications.	2	K2	CO3

17.	What environmental concerns are associated with the incineration of sludge?	*2*	*K1*	*CO4*
18.	Explain the role of coagulants in sludge conditioning.	*2*	*K2*	*CO4*
19.	How do eco-friendly chemicals contribute to pollution prevention.	*2*	*K1*	*CO5*
20.	What is the significance of Chemical Oxygen Demand (COD) in wastewater analysis?	*2*	*K1*	*CO5*
21.	Summarize the main challenges in treating textile wastewater.	*2*	*K2*	*CO6*
22.	What is the primary treatment method used to remove heavy metals from metal finishing wastewater?	*2*	*K1*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain in detail on bioassay tests and its applications in evaluating the toxicity of industrial effluents.	*11*	*K2*	*CO1*
		OR			
	b)	Summarise on the common sources of industrial wastewater, and how do they differ in characteristics.	*11*	*K2*	*CO1*
24.	a)	Outline the working principle of a Membrane Bioreactor (MBR) and list the advantages of MBRs over conventional biological treatment processes.	*11*	*K2*	*CO2*
		OR			
	b)	Explain in detail on Advanced Oxidation Processes (AOP), and how do they contribute to the degradation of organic pollutants in wastewater.	*11*	*K2*	*CO2*
25.	a)	Illustrate with a neat flow diagram the working principles of an Individual Effluent Treatment Plant (ETP) and How does it differ from a Common Effluent Treatment Plant (CETP) in terms of operation, cost, and environmental impact?	*11*	*K2*	*CO3*
		OR			
	b)	Explain Zero Effluent Discharge (ZED) and its significance in modern industrial wastewater management.	*11*	*K2*	*CO3*
26.	a)	Summarize the different methods of sludge thickening used in wastewater treatment plants with the advantages and disadvantages of each method.	*11*	*K2*	*CO4*
		OR			
	b)	Explain in detail the different methods of sludge disposal and enumerate the factors that influence the selection of disposal methods.	*11*	*K2*	*CO4*
27.	a)	Explain the role of water in industrial manufacturing processes and its impact on wastewater generation.	*11*	*K2*	*CO5*
		OR			
	b)	Explain in detail about the environmental impacts of improper industrial wastewater management, and how can industries mitigate these impacts.	*11*	*K2*	*CO5*
28.	a)	Outline the challenges faced in the treatment of tannery wastewater and present a case study highlighting an effective treatment method.	*11*	*K2*	*CO6*
		OR			
	b)	Explain in detail with the help of case study where a distillery implemented a Zero Liquid Discharge (ZLD) system.	*11*	*K2*	*CO6*