U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Civil Engineering **Duration: 3 hrs.**
Course Code: 21CV7PEIWW **Max Marks: 100**
Course: Industrial Wastewater Treatment

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Differentiate domestic and Industrial wastewater	CO1	PO1	**05**
	b)	Enumerate the importance of Industrial wastewater treatment	CO1	PO1	**05**
	c)	Explain the effects of different pollutants on streams and on municipal sewage treatment plant.	CO1	PO1	**10**
		OR			
2	a)	Explain the regulatory frame work and standards governing industrial waste water discharge.	CO 1	PO 1	**10**
	b)	Elaborate on the effluent, stream standards and legislation to Control water pollution	CO 1	PO 1	**10**
		UNIT - II			
3	a)	Compare stream standards and effluent standards.	CO2	PO1	**05**
	b)	With neat sketch illustrate oxygen sag curve in stream	CO2	PO1	**07**
	c)	A stream saturated with DO has a flow of 1.2 m^3/s, BOD of 4 mg/L and rate constant 0.3/day. It receives an effluent discharge of 0.25m^3/Sec, having BOD 20mg/L, DO 5 mg/L and rate constant 0.13 per day. The average velocity of flow of the stream is 0.18m/Sec. Calculate DO deficit at point 20km and 40km downstream. Assume that the temperature is 20^o C throughout and BOD is measured at 5 days. Assume saturation DO at 20^o C as 9.17mg/L.	CO2	PO1	**08**
		OR			
4	a)	A city discharges 100 cumecs of sewage into a river, which is fully saturated with oxygen and flowing at the rate of 1500cumecs during its lean days with a velocity of 0.1 m/sec. the 5-day BOD of sewage at the given temp is 280 mg/l. Find when and where the critical D.O Deficit will occur in the downstream portion of the river and what is its amount. Assume coefficient of purification of the stream(f) = 0.4 and K_d = 0.1.	CO 2	PO 1	**12**

		b)	Explain the process of self-purification of streams	*CO 2*	*PO 1*	**08**
			UNIT - III			
	5	a)	Enumerate different techniques for volume reduction of industrial waste water.	*CO3*	*PO1*	**10**
		b)	Explain equalization and proportioning of industrial wastewater with neat sketch.	*CO3*	*PO1*	**10**
			OR			
	6	a)	Enumerate different techniques for strength reduction of industrial waste water.	*CO3*	*PO1*	**10**
		b)	List and explain different neutralization methods.	*CO3*	*PO1*	**10**
			UNIT - IV			
	7	a)	Enumerate any five techniques for removal of inorganic dissolved solids	*CO3*	*PO1*	**10**
		b)	Enumerate any five techniques for treatment and disposal of sludge solids	*CO3*	*PO1*	**10**
			OR			
	8	a)	Enumerate any five techniques for removal of organic dissolved solids	*CO3*	*PO1*	**10**
		b)	Differentiate between organic and inorganic solids removal in industrial wastewater.	*CO3*	*PO1*	**10**
			UNIT - V			
	9	a)	Explain the advantages of joint treatment of raw industrial waste with domestic sewage.	*CO3*	*PO1*	**10**
		b)	With the help of flow diagram explain sources and characteristics of waste water generated from tanning process.	*CO3*	*PO1*	**10**
			OR			
	10	a)	With the help of flow diagram explain sources and characteristics of waste water generated from pulp and paper mills.	*CO3*	*PO1*	**10**
		b)	With the help of flow diagram explain sources and characteristics of waste water generated from sugar manufacturing process.	*CO3*	*PO1*	**10**

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