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: V**

Branch: Civil Engineering **Duration: 3 hrs.**

Course Code: 23CV5PCENV / 22CV5PCENV **Max Marks: 100**

Course: Environmental Engineering - II

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)		Enumerate different types of sewerage system with their advantages, disadvantages and Suitability	1	1	**8**
	b)		Discuss the importance of proper sanitation and wastewater treatment.	1	1	**6**
	c)		A 300 mm diameter sewer is to flow at 0.3 depth on a grade ensuring a degree of self cleansing equivalent to that obtained at full depth at a velocity of 0.9 m/sec. Find the required grade and associated velocity and rate of discharge at this depth. Assume Manning's rugosity coefficient n = 0.013. The variation of n with depth may be neglected.	1	1	**6**
			OR			
2	a)		Calculate the diameter and discharge of a circular sewer laid at a slope of 1 in 400 when it is running half full and with a velocity of 1.9 m/s. Use n = 0.012.	***CO 1***	***PO3***	**10**
	b)		Compare (i) Self-cleansing and non-scouring velocity	1	1	**4**
	c)		Explain the factors affecting the quantity of sewage flow.	1	1	**6**
			UNIT - II			
3	a)		Enumerate the factors to be considered while selecting particular material for a sewer.	2	2	**8**
	b)		Write a note on purpose and methods of testing of sewers.	2	2	**6**
	c)		Explain the characteristics of traps.	2	2	**6**
			OR			
4	a)		Enumerate different types of drainage traps.	2	2	**8**
	b)		Write a note on ventilation of sewers	2	2	**6**
	c)		Explain advantages and disadvantages of different Circular, trapezoidal and rectangular shapes of sewers.	2	2	**6**

			UNIT - III			
	5	a)	Differentiate BOD and COD	4	4	**7**
		b)	Compare aerobic and anaerobic activity	4	4	**5**
		c)	The BOD_6 of a wastewater is determined to be 400 mg/L at 20^o C. The k value at 20^o C is known to be 0.23 per day. What would be BOD_8 value if tests were run at 15^o C?	4	4	**8**
			OR			
	6	a)	Define sewage sickness. Enumerate preventive measures to avoid sewage sickness.	4	4	**7**
		b)	With the help of neat sketch explain zones of pollution in stream.	4	4	**6**
		c)	Find out Dissolved Oxygen (DO) at the end of day1 and day 2 from the following data. Assume Deoxygenation constant as 0.1 per day and Reoxygenation constant as 0.3 per day; Saturation DO as 9.10mg/L. River: Flow(m^3/Sec) = 25; DO (mg/L) = 9.1; 5 day BOD (mg/L) = 2 Wastewater: Flow(m^3/Sec) = 2; DO (mg/L) = 0; 5 day BOD (mg/L) = 200	4	4	**7**
			UNIT - IV			
	7	a)	Write Flow diagram of municipal sewage treatment plant. Explain the importance of each unit.	3	3	**8**
		b)	Compare suspended growth and fixed film biosphere process with examples.	3	3	**6**
		c)	With neat sketch explain activated sludge process.	3	3	**6**
			OR			
	8	a)	With neat sketch enumerate the importance of Skimming tank and sedimentation tank.	3	3	**8**
		b)	Compare conventional and high-rate trickling filter.	3	3	**6**
		c)	Explain the importance of solid waste management	1	1	**6**
			UNIT - V			
	9	a)	With neat sketch enumerate the process of SBR in wastewater treatment.	3	3	**8**
		b)	Enumerate the importance of reuse and recycle of wastewater	1	1	**6**
		c)	Explain the advantages and disadvantages of MBR in wastewater treatment.	3	3	**6**
			OR			
	10	a)	With neat sketch enumerate the process of MBBR in wastewater treatment.	3	3	**8**
		b)	Enumerate the importance of nitrogen and phosphorous removal in wastewater treatment.	4	3	**6**
		c)	Compare MBBR and MBR	3	3	**6**

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