U.S.N.										

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

Autonomous Institute Affiliated to VTU

September / October 2024 Supplementary Examinations

Programme: B.E. **Semester: V**
Branch: Civil Engineering **Duration: 3 hrs.**
Course Code: 20CV5PCWWT **Max Marks: 100**
Course: Waste Water 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

1	a)	Explain the necessity and importance of sanitation.	**06**
	b)	Calculate the velocity of flow, and discharge in a sewer of circular section having diameter of 1 m, laid at a gradient of 1 in 500, use Mannings formula taking N = 0.012, assume that the sewer is running half.	**06**
	c)	Describe merits and drawback of separate system and combined system.	**08**

UNIT - II

2	a)	Draw a plan showing house drainage connections with labelling the parts.	**04**
	b)	Explain the various types of materials used for sewer construction	**08**
	c)	What are sewer appurtenances? Explain with a neat sketch, the construction and working of a manhole.	**08**

UNIT - III

3	a)	With Neat sketch explain oxygen sag curve	**10**
	b)	Explain physical, chemical and biological characteristics of waste water.	**10**

OR

4	a)	What is sewage sickness?	**04**
	b)	Enumerate the process of collection and preservation of water samples and explain the grab sampling and composite sampling methods.	**08**
	c)	A city discharges 100 cumecs of sewage into a river, which is fully saturated with oxygen and flowing at the rate of 1500 cumecs during its lean days with a velocity of 0.1 m/sec. The 5 days BOD of sewage at the given temperature is 280 mg/L. Determine when and where the critical DO deficit will occur in the downstream portion of the river. Assume coefficient of purification of the stream (f) as 4, DO of river water as 9.2 mg/L and de-oxygenation coefficient (KD) as 0.1.	**08**

UNIT - IV

5	a)	Explain with neat flow diagram , conventional sewage treatment plant, explain the functions of each component.	**10**
	b)	Design a continuous flow rectangular sedimentation tank fitted with mechanical sludge cleaning equipment for treating the sewage from a city having a population of 95000 persons which has an assured water supply rate of 135 LPCD. Assume maximum flow to be 1.4 times the average flow. The necessary design parameters may be assumed.	**10**

OR

6	a)	With the help of a neat discuss the principles involved in working of Grit chamber and skimming tank	**10**
	b)	With neat diagram, explain the working principles of Activated sludge process.	**10**

UNIT - V

7	a)	Describe the merits and drawback of reverse osmosis technique.	**06**
	b)	Explain ion exchange method for treating wastewater.	**06**
	c)	Briefly explain Microfiltration, Ultrafiltration and Nanofiltartion techniques.	**08**

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