U.S.N.										

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

Autonomous Institute Affiliated to VTU

August 2024 Supplementary Examinations

Programme: B.E. **Semester: VII**
Branch: CIVIL ENGINEERING **Duration: 3 hrs.**
Course Code: 21CV7PEIWW **Max Marks: 100**
Course: Industrial 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.

UNIT - I

1 a) Differentiate between the characteristics of domestic sewage and industrial wastewater. **08**

b) Describe stream standards and effluent standards to control pollution of streams. **06**

c) Discuss the effects of untreated industrial wastewater on the receiving streams/water bodies. **06**

UNIT - II

2 a) Explain the phenomenon of self-purification of natural streams. Discuss the various factors affecting self-purification process. **10**

b) A city discharges 100cumecs 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 0.10m/sec. The 5 day B.O.D of sewage at the given temperature is 280mg/lit. Find when and where the critical D.O deficit will occur in the downstream portion of the river and what is its amount?. Assume co- efficient of purification of the stream as 4 and co-efficient of deoxygenation as 0.10. Also assume D.O of sewage to be nil and saturation D.O as 9.20mg/l. **10**

UNIT - III

3 a) Illustrate oxygen- sag curve and its significance in the self-purification of streams. **10**

b) A city discharges 1500lit/sec of sewage into a stream whose minimum rate of flow is 6000lit/sec. The temperature of sewage as well as water is 20^{o} C. The 5 day BOD for sewage is 200 mg/lit and that of river water is 1mg/lit. The DO content of sewage is zero and that of the stream is 90% of the saturation DO. If the minimum DO to be maintained in the stream is 4.5mg/lit, find out the degree of treatment required. Assume the deoxygenation co efficient as 0.10 and re oxygenation coefficient as 0.3. The saturation DO at 20^{o} C is 9.17mg/lit. **10**

OR

4	a)	Enumerate various volume reduction methods. Explain how they are accomplished in the treatment of industrial wastewater using any two methods.	**10**
	b)	Enumerate various methods of strength reduction. Explain briefly any two of them.	**10**

UNIT - IV

5	a)	List out various methods employed for removing Inorganic dissolved solids form industrial wastewaters. Explain briefly any two of them.	**10**
	b)	Enumerate various methods employed for removal of Organic dissolved solids from industrial wastewater. Explain any two of them in detail.	**10**

UNIT - V

6	a)	Explain the sources and characteristics of wastewater from a typical tannery industry.	**10**
	b)	Illustrate with a neat flow diagram, the treatment of cotton textile industry wastewater.	**10**

OR

7	a)	Illustrate with a neat flow diagram, the treatment of paper and pulp industry effluents.	**10**
	b)	Explain the sources and characteristics of Pharmaceutical industry wastewater.	**10**

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