



Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, April 2014
(2008 Scheme)**

08.803 : ENVIRONMENTAL ENGINEERING – II (C)

Time : 3 Hours

Max. Marks : 100

- Instructions :** 1) Answer **all** questions **fully**.
2) Assume **any suitable** data **if necessary**.

PART – A

1. Distinguish between BOD and COD.
2. Explain how self purification is achieved in streams.
3. If the catchment served by a sewerage system is 40 hectares and the duration of storm is 12 minutes, what is the run off from catchment determined by rational method ? Take impermeability coefficient as 0.5.
4. Compare a standard rate trickling filter with a high rate one.
5. With a neat sketch explain a contact bed used in waste water treatment.
6. Derive an expression for self cleansing velocity in a sewer.
7. Write a short note on aerated lagoons.
8. Discuss methods of disposal of sludge. **(8×5=40 Marks)**

PART – B

Module – I

9. a) Explain the significance of BOD determination of a waste water sample ?
What are the limitations of this test ?

P.T.O.



b) If 2 day BOD at 25°C of a sewage sample is 200 mg/L. What is its 5 day BOD at 30°C. IC=0.23/day at 20°C.

c) What do you mean by relative stability of sewage sample ? (5+10+5)

OR

10. The sewage discharge of a city is 80 L/S in a river having a minimum discharge of 950 L/S with a velocity of 0.12 m/s. The BOD₅ of sewage at 20°C is 325 mg/L and initial DO deficit is zero. Determine the quantity of critical oxygen deficit and find where it occurs in the stream.

Take $K_D=0.1/\text{day}$ and $K_R=0.3/\text{day}$. 20

Module – II

11. Design an imhoff tank to treat 4.5 MLd of waste water. 20

OR

12. a) Explain design considerations of a grit chamber used in waste water treatment.

b) Determine the size of a high rate trickling filter for the following data :

Sewage flow = 4.5 MLd

Recirculation ratio = 1.5

BOD of raw sewage = 300 mg/L

BOD removal in primary sedimentation tank = 30%

Final effluent BOD desired = 25 mg/L

Determine the size of a standard rate trickling filter for treating the same sewage. (6+14)

Module – III

13. a) Explain sludge drying beds.

b) Write a short note about disposal of sludge by incineration.



c) A sedimentation tank treats 7 MLd of sewage per day containing 400 mg/L of suspended solids. The tank removes 60% suspended matter. If the moisture content of the sludge formed is 97%, calculate the quantity of sludge per day in bulk and weight. Assume specific gravity of sludge as 1.03. If moisture content is reduced to 95%, what about the volume of sludge to be disposed off ? **(5+5+10)**

OR

14. a) Explain different systems of plumbing.

b) Determine the size of a circular sewer for a combined system of sewerage.

Given area to be served 100 hectares, population of one lakh and rate of water supplied is 150 Lpcd. Time of entry is 3 minutes, Time of flow 15 minutes.

Take impermeability coefficient 0.5 and maximum permissible velocity in the sewer is 2 m/s. Assume 80% of water supplied come as sewerage. **(10+10)**
