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A – 2244

Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, April 2016
(2008 Scheme)**

08.803 : ENVIRONMENTAL ENGINEERING – II (C)

Time : 3 Hours

Max. Marks : 100

Instruction : Answer *all* questions. **Assume** any suitable data if *necessary*.

PART – A

1. Discuss land treatment of sewage.
2. Explain Streeter-Phelps equation.
3. If the period of incubation is 10 days at 20°C in the relative stability test on sewage, calculate the percentage of relative stability. Comment on the result.
4. Compare the design and performance of a high rate trickling filter with that of a standard rate trickling filter.
5. Define Sludge volume index. How will you measure it ?
6. What is the significance of reducing moisture content of sludge ? The moisture content of a sludge is reduced from 95 to 90% in a sludge digestion tank. Find the percentage decrease in the volume of sludge.
7. Enumerate the points you need to consider for selection of a sewer material. Name any six materials used for making sewers.
8. Write a short note on sludge drying beds. **(8×5=40 Marks)**

PART – B

Module – I

9. a) Derive an expression for calculating ultimate BOD of a waste water sample.
b) How BOD is different from COD ?
c) The BOD of a sewage incubated for one day at 30°C has been found to be 120 mg/l. What will be the 5-day BOD at 20°C ? Assume $K = 0.12$ per day at 20°C. **(5+5+10)**

OR

P.T.O.



10. A town discharge 120 cumecs of sewage into a river having a rate of flow of 1600 cumecs during lean period with a velocity of 0.1 m/s. The 5-day BOD of sewage at the given temperature is 250 mg/l. Find the amount of critical DO deficit and when and where it will occur in the downstream portion of the river. Assume deoxygenation coefficient as 0.1/day and coefficient of self purification 3.5. Saturation DO at given temperature is 9.2 mg/l.

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Module – II

11. a) Discuss preliminary, primary and secondary treatment of waste water.
b) Design a septic tank for a population of 100 person provided with a water supply 150 liters per capita per day.
c) What are the different methods of disposal of waste water from a septic tank ?

(5+10+5)

OR

12. a) Design suitable dimensions of a circular trickling filter and its rotary distribution system for treating waste water from 30,000 population with a sewage flow 160 liters per capita per day and BOD 150 mg/litre.
b) With a flow diagram explain processes involved in an activated sludge process.

(14+6)

Module – III

13. a) Discuss different systems of plumbing.
b) What do you know about principles of house drainage ?
c) A small town with a projected population of 30,000 residing over an area of 16 hectares is provided with a water supply at 150 lpcd. And same amount comes as waste water. Find the design discharge for a combined sewer. Assuming runoff coefficient = 0.4 and time of concentration = 15 minutes.

(5+5+10)

OR

14. a) Define sludge digestion. Explain the stages and factors affecting it.
b) Design a sludge digestion tank for the treatment of primary sludge with the following data. Average flow being 250 Mld, Total suspended solids in raw sewage as 350 mg/L and moisture content of the digested sludge is 80%.

(10+10)