

**B.Tech. Civil (Water Resources
Engineering)**

Term-End Examination

December, 2013

ET-507(B) : WASTE WATER TREATMENT

Time : 3 hours

Maximum Marks : 70

Instruction : Attempt any five questions. All questions carry equal marks. Assume any data suitably , if necessary. Use of scientific calculator is permitted.

- (a) A drain with a flow of $0.1\text{m}^3/\text{s}$ and chloride concentration of $50\text{mg}/\text{l}$ is discharged into a river. The upstream flow in the river is $10\text{ m}^3/\text{s}$. With chloride concentration of $200\text{ mg}/\text{l}$. Determine the concentration of chloride downstream at the point of drain outfall. Assume instantaneous mixing across the x-section of the river. 7
- (b) Explain in detail the Do sag curve. 7
- (a) Briefly explain the biological characteristics of waste water. 7
- (b) 5-day BOD of a sewage is $200\text{ mg}/\text{l}$. Determine the ultimate BOD. Also determine the 10-days BOD. If the sample had been incubated at 25°C , what would have been 5-days BOD. ($k=0.23\text{d}^{-1}$) 7

3. (a) Determine the gross area of screen required to treat $2500\text{m}^3/\text{d}$ of raw sewage. Take velocity through screen as 0.8 m/s at inclination of 60° .
(b) Briefly describe the principle of gas transfer. Also describe its role in waste water treatment.
4. (a) Describe the distinguishing factors of Acrobic oxidation and anaerobic decomposition processes of waste water treatment.
(b) A mixed liquor sample from an Activated sludge plant was allowed to settle in a one-litre measuring cylinder. After a period of 30min. a volume of 200ml of sludge was recorded. Determine the SVI if MLSS concentration is 2500 mg/l .
5. (a) Determine the dimensions of septic tank required for a community of 200 persons provided with an assured water supply at the rate of 135 lpcd.
(b) What are different processes used for sludge treatment ? Briefly explain.
6. (a) Describe the necessity for reuse of waste water and its advantages.
(b) Describe the factors that should be considered while designing a ground water recharge system.

7. Write short notes on **any four** of the following :

- (a) Rotating biological contactor 4x3½=14
 - (b) Trickling Filter
 - (c) Extended Aeration
 - (d) Oxidation Ditch
 - (e) Flushing Cistern
 - (f) Ventilation of sewers
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