

Code: CE6T4

III B.Tech - II Semester – Regular Examinations – April 2016

**ENVIRONMENTAL ENGINEERING - II
(CIVIL ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1. a) Briefly explain the factors affecting the quantity of dry weather flow. 7 M

- b) A small town with a projected population of 30,000 residing over an area of 16 hectares is provided with a water supply @ 150 lpcd. Find the design discharge for a combined sewer. Assume runoff coefficient=0.4; Time of concentration=15min. Make suitable assumptions wherever necessary. 7 M

2. a) For a circular sewer and a rectangular sewer to be hydraulically equivalent, find the relation between the depth of the rectangular sewer and diameter of the circular sewer. Take width of rectangular sewer as twice the depth and assume that only three sides of rectangular sewer are wetted. 7 M

- b) Explain the necessity of providing manhole in a sewer line. Draw a neat sketch of the sectional elevation and sectional plan of a manhole. 7 M
3. a) The BOD of a sewage incubated for one day at 30°C has been found to be 120mg/l. What will be the 5 day BOD at 20°C. Assume $K=0.12$ per day at 20°C. 7 M
- b) Write a note on physical and chemical characteristics of sewage. 7 M
4. a) What do you understand by velocity control devices? What are the different types of velocity control devices used with a grit chamber? 7 M
- b) Design a septic tank for 120 users. Sewage generation is 140lpcd. Desulding period is 1 year. Consider L:B as 4:1. 7 M
5. a) Design a high rate trickling filter to treat sewage flow of 10MLD with recirculation of 1.5. The influent BOD is 250mg/l into the PST where 30% removal is reported. The effluent BOD should be 30mg/l. 7 M
- b) Mention the operational troubles of a standard rate trickling filter and their remedies. 7 M

6. a) What do you understand by Oxygen sag curve? 7 M
- b) Explain self purification of streams and indicate how sunlight helps in such purification. 7 M
7. a) Briefly explain the factors affecting sludge digestion. 7 M
- b) Explain briefly the characteristics of sludge produced in various treatment processes. 7 M
8. a) Differentiate between anaerobic and aerobic digestion of sludge with focus on their mechanism. 7 M
- b) Design a gravity thickener for thickening the combined primary and secondary activated sludge from a STP treating sewage generated from a population of 1,50,000. 7 M