

Code: CE6T4

**III B.Tech - II Semester – Regular/Supplementary Examinations
March 2020**

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

Duration: 3 hours

Max. Marks: 70

PART – A

Answer *all* the questions. All questions carry equal marks

11x 2 = 22 M

1.

- a) Differentiate between sewage and garbage.
- b) What is meant by sludge recycling?
- c) List out different types of sewerage systems.
- d) What is sedimentation?
- e) List out different types of screens.
- f) What is a trickling filter?
- g) What do you understand by digestion of sludge?
- h) List out the methods of disposal of sewage.
- i) What are the stages of anaerobic digestion?
- j) What are the characteristics of municipal solid waste?
- k) Describe the problems associated with solid waste disposal.

PART – B

Answer any *THREE* questions. All questions carry equal marks.

3 x 16 = 48 M

2. a) How is the quantity of storm water runoff from a town estimated while designing scheme for the same? 8 M
- b) The main combined sewer is to be designed to serve an area of 12 km^2 with a population of 250 person per hectare. The average rate of flow is 250 LPCD. The maximum flow is 100% in excess of average together with the rainfall equivalent of 15 min in 24 hours, all of which are runoff. Determine the capacity of the sewer. Taking maximum velocity of flow as 3m/s, also determine the size of the sewer. 8 M
3. a) Describe the steps involved in the design of septic tank. And also explain the working of a septic tank with neat sketch. 8 M
- b) Explain briefly different characteristics and composition of sewage. 8 M
4. a) Explain the working of conventional activated sludge process (ASP) with flow diagram. 8 M
- b) With a neat sketch, explain the construction and working of a trickling filter. 8 M

5. a) Explain the Zones of pollution in a river stream with the help of neat sketch. 8 M

b) A waste water effluent of 600 l/s with a BOD = 60 mg/l. DO = 2.5 mg/l and temperature of 25 °C enters a river where the flow is 30 m³/sec and BOD = 3 mg/l. DO = 8.5 mg/l and temperature of 16 °C deoxygenation constant for the waste is 0.10 per day at 20 °C. The velocity of water in the river downstream is 0.15 m and depth of flow is 1.5 m/s. Determine the following after mixing of waste water with the river water: (i) Combined Discharge, (ii) BOD, (iii) DO, (iv) Temperature. 8 M

6. a) Discuss the operation and maintenance of solid waste collection and transfer stations. 8 M

b) Mention the various physico-chemical, biological characteristics of municipal solid waste. 8 M