

QP Code: 26310

(3 Hours)

[Total Marks: 80

- N.B:** 1. Question No.1 is compulsory
 2. Attempt any **three** questions from remaining five questions.
 3. Assume any suitable data where ever required.
 4. Figures to the right indicate full marks.

- Q.1** Solve the following : 20
- a. What is conservancy system and water carriage system?
 - b. Compare, in a tabular form, low rate and high rate tricking filters.
 - c. What are drop manholes and lamp holes?
 - d. What is self-purification of stream?
- Q.2** 10
- a. Design a septic tank for a hostel housing 125 persons. Also design the soil absorption system for the disposal of the septic tank effluent, assuming the percolation rate as 20 minutes per cm.
 - b. Explain with the help of diagram, various systems of plumbing used for house drainage. 10
- Q.3** 10
- a. Explain the necessity and process mechanism of anaerobic digestion of sludge. How the solid, liquid and gaseous products of digestion are disposed off?
 - b. Design a conventional activated sludge plant to treat domestic sewage, given the following data: 10
 Population=40,000
 Average sewage flow=180 lpcd
 BOD of sewage=240mg/lit
 BOD removed in primary clarifier=25%
 Overall BOD reduction=80%
 Based on the information above, determine
 (a) Volume of aeration tank
 (b) Aeration period or H.R.T.
 (c) Sludge Retention Time
 (d) Tank dimensions
- Q.4** 10
- a. During BOD test conducted on a 5% dilution of waste, the following observations were taken. 10
 i) DO of aerated water used for dilution=3.6mg/lit
 ii) DO of original sample=0.8mg/lit
 iii) DO of diluted sample after 5 day incubation=0.7mg/lit
 Compute
 a) 5day BOD b) Ultimate BOD
 - b. Explain with diagram various equipment's used for the control of particulate pollutants. 10

Turn Over

- Q.5 a. Draw a neat sketch of a typical sewage pumping station and describe in brief the functions of each. 08
- b. Explain in brief different testing methods for sewer pipes and why sewers run partially full. 06
- c. Design a circular primary settling tank for a town having a population of 50,000 with a water supply of 180 litres per capita per day. 06
- Q.6 Write short note on (any four) 20
- a. Sampling of sewage
 - b. Control measures of noise pollution
 - c. Recycling and reuse of waste water
 - d. Grit Chamber
 - e. Anti-siphonage pipe
 - f. Inverted siphon.