

(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 Attempt any **four**
- a. Explain effect of noise pollution with control measures. 05
  - b. Why sewers are designed to run partially full? 05
  - c. What do you understand about aerobic decomposition and anaerobic decomposition? 05
  - d. Define F/M and Sludge Age 05
  - e. Draw a neat sketch of Drop manhole. 05
- Q.2 a. Calculate 2 day  $37^{\circ}\text{C}$  BOD of sewage sample whose 5day  $20^{\circ}\text{C}$  BOD is 150mg/lit. Assume  $K_D$  at  $20^{\circ}\text{C}$  as 0.1 10
- b. Explain the various system of plumbing. 10
- Q.3 a. Explain the necessity and process mechanism of anaerobic digestion of sludge. How the solid, liquid and gaseous products of digestion are disposed off? 10
- b. Describe physical, chemical and Biological characteristics of sewage and their significance in Waste water Treatment. 10
- Q.4 a. Explain the modifications in the conventional sludge process. What are the draw backs of conventional activated sludge process? 10
- b. Design the dimensions of a septic tank for a small colony of 150 persons provided with an assured water supply from the municipal head-works at a rate of 120 litres per person per day. Assume any data, you may need. 10
- Q.5 a. Determine the size of a high rate trickling filter for the following data: 10  
Flow=5.5Mld  
Recirculation ratio=1.5  
BOD of raw sewage=280mg/lit  
BOD removed in primary clarifier=25%  
Final effluent BOD desired=40mg/lit
- b. Give classification of air pollutants and control measures for gaseous and particulate matter. 10
- Q.6 Write short note on (any four) 20
- a. Differentiate between combined and separate system of sewage
  - b. Sludge volume Index
  - c. Sludge Thickener
  - d. Grit Chamber
  - e. Anti-siphonage pipe