

(3 Hours)

(Total Marks: 80)

**N.B:** (1) Question no. 1 is compulsory.

(2) Attempt any three questions out of five questions.

(3) Assume suitable data wherever required and state it clearly.

1. Attempt any four of the following

- Explain oxygen sag curve.
- Give the differences between aerobic and anaerobic processes.
- Draw a flow sheet for conventional sewage treatment plant.
- Write a short note on BOD.
- Prove that  $50 \text{ dB} + 50 \text{ dB} \neq 100 \text{ dB}$ .

**20**

2. (a) Design the dimensions of a septic tank for a colony of 200 persons provided with an assured water supply from the municipal head-works at a rate of 100 liters per person per day. Assume any data if required.

**10**

(b) Differentiate between primary and secondary pollutants. Write a note on air pollution caused by automobiles and its control.

**10**3. (a) Calculate the discharge of 1.0m circular sewer laid at a slope of 1 in 500, When it is running half full. Assume  $n$  in manning's formula as 0.011. Draw a figure of partially filled circular sewer section.**10**

(b) Explain the process mechanism of ASP with neat sketch.

**10**4. (a) The 5 day  $30^\circ\text{C}$  BOD of a sewage sample is 110 mg/lit. Calculate its 5 day  $20^\circ\text{C}$  BOD. Assume  $KD=0.10$  per day.**10**

(b) Explain any two sewer appurtenances with neat sketches.

**10**

5. (a) Enlist different types of traps in plumbing. Explain any two with neat sketches?

**10**

(b) Determine the size of high rate trickling filter for following data:

**10**

I) Flow = 4.5 MLD

II)  $\text{BOD}_5$  of raw sewage = 250 mg/lit

III) Recirculation ratio = 1.4 IV) BOD removed in primary Clarifier = 25%

V) Final effluent BOD desired = 50 mg/lit

6. Write short note on (any four)

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- a) Sewage sickness
- b) Crown corrosion
- c) Combined & separate system of sewerage.
- d) Oxidation pond
- e) Population Equivalent.

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