

Dec 13 (KVIC)

Roll No. Total Pages : 04

BT-7/D-13 8746

SEWERAGE AND SEWAGE TREATMENT

CE-407-E

Time : Three Hours [Maximum Marks : 100

Note : Attempt Five questions in all, selecting at least one question from each Unit. All questions carry equal marks. Assume appropriate data wherever necessary.

Unit I

- 1. (a) What is Sanitation ? Discuss its importance.
- (b) Explain the following :
 - (i) Self cleaning velocity of sewers
 - (ii) Difference between egg shaped and circular sewer
 - (iii) Sewer appurtenances
 - (iv) Testing of sewers.

- 2. (a) A 45 cm diameter circular sanitary sewer is laid at a slope of 1 in 250. Calculate the following :
 - (i) Velocity of flow and discharge when flowing full
 - (ii) Velocity and discharge when flowing half full.

(1-19) L-8746 P.T.O.

- 8. (a) Explain in brief various zones of pollution in streams.
- (b) What do you understand by the method disposal by irrigation ? Explain giving its merits and demerits.

L-8746 4 5,600

(b) What is Manhole ? Explain drop manhole with the help of a neat sketch.

Unit II

3. (a) Name various physical characteristics of sewage and explain significance of colour and suspended solids.

(b) What is biochemical oxygen demand ? Derive an expression to calculate BOD exerted in t days at 20°C for sewage.

4. (a) What is difference between settleable and non-settleable solids ? How is settleable solids determined ? Explain.

(b) Give permissible limits of the following parameters if effluent is discharged on land :

- (i) pH
- (ii) Suspended solids
- (iii) BOD
- (iv) Oil and Grease
- (v) Arsenic.

Unit III

5. (a) What are objectives of sewage treatment ? Draw a schematic flow diagram of a conventional sewage treatment plant.

(b) What is grit chamber ? Explain its working with help of a neat labelled diagram.

6. (a) What is Activated sludge process ? Explain giving names of its various modifications.

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

- (i) Sewage flow 2 million liters per day.
- (ii) Recirculation ratio 1.2
- (iii) Influent BOD 300 mg/L.

Unit.IV

7. (a) What do you understand by the method disposal by dilution ? Explain giving its merits and demerits.

(b) What is sewage sickness ? Suggest measures to prevent sewage sickness.