

QP Code : 8386

(REVISED COURSE)

(3 HOURS)

[TOTAL MARKS: 100]

N.B.: (1) Question No. 1 is compulsory.

(2) Attempt any four questions from remaining six questions.

(3) Assume any suitable data but state the same.

(4) Illustrate answer with sketches wherever necessary.

- Q1. A. Explain design parameters of grit chambers and its significance in treatment process 5  
 B. Define population equivalent. How it is implemented in sewage treatment process. 5  
 C. Draw a neat sketch of oxygen sag curve. 5  
 D. What is BOD and COD? Role of BOD in design of sewage treatment units. 5
- Q2.A. A city on with 2 lakh population produces sewage at the rate of 200 lpcd and the sewage treatment plant effluent has a BOD<sub>5</sub> of 30 mg/l at 20° C and a D.O of 1.7 mg/l. The effluent is discharged into a stream having a flow of 5m<sup>3</sup>/sec. at a velocity of 40 cm/sec. the stream temperature remains unchanged at 20° C after the discharge of the effluent, the stream which is 90% saturated with D.O has a BOD<sub>5</sub> of 1.0 mg/l, a self purification factor  $f=2.25$  at 20° C with  $k_1=0.1$ /day. The saturation D.O at 20° C is 9.2 mg/l. Assume data necessary. Determine:  
 1) The value of initial D.O deficit for the stream just below the point of plant discharge.  
 2) The distance downstream of the river at which the D.O is minimum.  
 3) The magnitude of Dc. 15  
 B. Write a detailed note on laying of sewers. 5
- Q3. A. Design sedimentation tank for 15 MLD and check for SOR. Assume necessary data. 10  
 B. Write a note on types of sewer and sewer appurtenances. 10
- Q4. A. Design septic tank for 150 people. Assume necessary data. 10  
 B. Write a detailed note on self purification of natural streams. What are actions involved in it. 10
- Q5. A. What are types of aeration tanks. What is role of aeration in activated sludge process? 10  
 B. Explain with a neat sketch working and operational troubles of trickling filter. 10
- Q6. A. Write a note on sludge dewatering and sketch sludge drying bed. 10  
 B. Compare oxidation pond and oxidation ditch. 10
- Q7. Write short note on any four. 20  
 A. Plumbing Systems  
 B. Sludge Digestion  
 C. SVI and F/M ratio  
 D. Aerated Lagoon  
 E. Imhoff tank  
 F. Testing of sewer lines.