

Seat  
No.

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मजल - 076

## Environmental Engineering - II (New) (1240)

P. Pages : 2

Time : Three Hours

Max. Marks : 100

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Answer **any two** question from each unit.
5. Figures to the right indicates full marks.
6. Use of non-programmable calculator is allowed.
7. Assume suitable data if necessary.

### UNIT - I

1. a) Write a note on various physical properties of wastewater ? Also give a list of various constituents of wastewater. 10  
b) Differentiate between 'Oxygen demand' and 'biochemical oxygen demand' ? How do you determine BOD ? What are the limitations of BOD test ? 10  
c) Write short note on : 10
  - i) Oxygen Sag Curve.
  - ii) Zones of pollution.

### UNIT - II

2. a) A main combined sewer is to be designed to serve an area of 12 sqkm with a population density of 250 persons / hectare. The average rate of sewage flow is 250 lpcd. The maximum flow is 100% in excess of average together with the rainfall equivalent of 15mm in 24 hrs all of which are runoff. Determine the capacity of the sewer. Taking the maximum velocity of flow as 3 m/sec. Determine the size of the circular sewer. 10  
b) Write a note on various shapes of sewer sections & what are the advantages of circular sewer ? 10  
c) What do you understand by 'sewer appurtenances' ? Explain the principle of working of oil and grease trap ? 10

**UNIT - III**

3. a) Design a primary settling tank for a town having a population of 50,000 with a water supply of 180 lpcd.  
 i) Design rectangular shape.  
 ii) Design a circular shape for above data. **10**
- b) Write short notes on : **10**  
 i) Hazen's modified equation for settling velocity.  
 ii) Uses of chemical clarification.
- c) What do you mean by skimming tank & write a note on vacuum floatation ? **10**

**UNIT - IV**

4. a) The MLSS concentration in an aeration tank is 2000 mg/l and the sludge volume after 30 minutes of settling in 1000 ml graduated cylinder is 176 ml calculate  
 i) SVI **ii) SDI**  
 iii) Required return sludge ratio and  
 iv) SS concentration in the recirculated sludge **10**
- b) What do you understand by a 'trickling filter' ? Explain biological process involved in working of trickling filter. **10**
- c) What is 'stabilization pond' ? Write purpose, types of stabilization ponds with their functioning ? **10**

**UNIT - V**

5. a) Discuss in brief various types of solid waste & give its composition for an average Indian city. **10**
- b) Explain the types of collection systems used for solid waste ? How to determine the vehicle and labour requirement for collection systems ? **10**
- c) Write short notes on: **10**  
 i) Transfer stations & their locations.  
 ii) Volume reduction and recovery.

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