



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

**P. Pages : 3**

**Time : Three Hours**

**Max. Marks : 100**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answer sheet 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. Attempt all questions. Internal choice is given of two question in each unit.
5. Use of non programmable calculator is allowed.
6. Make necessary assumptions.

**UNIT - I**

1. a) i) A dairy industry generates 10 lakh L of waste water every day with an average BOD of 1000 mg/L. Estimate its population equivalent factor considering average BOD of domestic sewage to be 300 mg/L. 8  
ii) Why COD is always greater than BOD ? 2
- b) i) BOD<sub>5</sub> C<sub>20</sub>°C of a wastewater is 300 mg/L. Estimate BOD<sub>7</sub> C<sub>10</sub>°C for the water water considering BOD satisfaction rate constant to be 0.1at 20°C to the base of 10. 8  
ii) Draw oxygen sag curve indicating critical deficit point. 2
- c) i) Draw microbial kinetic curve for a batch reactor, Explain it. 8  
ii) Why methylene blue is added in BOD determination test ? 2

**UNIT – II**

2. a) i) Why it is descrable to transport sewage by under ground sewer line as compare to open drain ? 8

- ii) What is self cleansing velocity ? 2
- b) (i) Design a combined sewer to serve a population of 5000. The catchment area is of 10 hectares having maximum rainfall 25mm per hour and an average coefficient of run off as 0.4. 8
- ii) What is a lamp-hole ? 2
- c) i) Enlist the common materials used for sewer construction and describe their benefits and limitations. 8
- ii) What is an inverted siphon ? 2

### UNIT – III

3. a) i) Design an aeration tank of an activated sludge process for a population of 120000. 5
- ii) Design a secondary sedimentation tank for the case of above. 5
- b) i) Design a Trickling filter using NRC formula for a population of 120000 to yield 90% over all efficiency. 8
- ii) How aeration takes place in trickling filters ? 2
- c) i) Design an oxidation pond to serve population of 50000, in Khandesh region. 5
- ii) What is the role of algae in oxidation pond ? 5

### UNIT – IV

4. a) Design a grit chamber for a domestic sewage of 10 MLD. Draw schematic diagram of grit chamber. 10
- b) What is the principle of working of skimming tank ? What is their importance in wastewater treatment ? Draw schematic diagram of a skimming tank. 10
- c) i) What is a comminutor ? 3
- ii) What is the function and importance of screens ? 5
- iii) Why coagulation of sewage is not a preferred practice ? 2

**UNIT - V**

5. a) Describe a sampling plan for solid waste of municipal origin. **10**
- b) Why recycling of solid waste is not considered to be feasible in Indian conditions ? **10**
- c) Describe land filling of solid waste. **10**

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