Total number of printed pages: 3 **Program (UG)/6th/UCE603**

2024

Environmental Engineering-II

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. a) For a wastewater sample, 5 day BOD at 20 °C is 200 mg/l and is 67% of the ultimate BOD. What will be the 4 day BOD at 30 °C. 10

   b) The maximum daily demand at a water treatment plant is estimated as 12 MLD. Design the dimensions of a suitable sedimentation tank assuming detention period of 6 hours and velocity of flow as 20 cm/min. Assume height of tank as 4m. 10

2. a) Describe the 1st stage BOD curve with the help of a neat schematic diagram. 8

   b) The BOD of sewage incubated for 1day at 30° C has been found to be 150 ppm, what will be the 5 day BOD at 20°C. Assume K=0.12 (base 10) at 20°C. 12

3. a) At which stage of sewage treatment process, sludge is produced? Describe the sludge formation process. 2+3=5

   b) 2 MLD of water is passing through a sedimentation tank which is 6m wide, 15m long 3×2=6

& 3m deep. Find

(i) Detention time

(ii) Average flow velocity

(iii) Overflow rate

c) For WCS, write the methodology for combined WCS, separate WCS and partially combined WCS in a comparative manner. 3+3+3=9

4. a) Elaborate the significance of BOD and COD in wastewater treatment. 2.5×2 = 5

b) Define the term catchment area, dry weather flow and time of concentration. 2+2+2 = 6

c) Differentiate between unit operation and unit process of a treatment system. 2.5×2 = 5

d) What is meant by BOD_5? Why it is important? 2+2 = 4

5. a) What are the various wastewater characteristic categories? List out the various characteristics in each category. Describe each of them in detail. 3+6+11=20

6. a) What are the various types of sewerage systems? Explain each of them briefly. 3+3=6

b) A sewer has a catchment area of 70 hectares. Estimate the storm water flow corresponding to a rainfall of 4 cm during a time of concentration of 0.5 hours. Assuming the impervious area is equal to 50% of the total catchment area. Use Lloyed Davis formula. 08

c) What are the various stages of a typical wastewater treatment system? Describe each of them briefly. 2+4=6

THE END


CENTRAL INSTITUTE OF TECHNOLOGY
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