Total No. of printed pages = 3

19/6th Sem/UCE 603

2022

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) Elaborate the significance of BOD and COD in wastewater treatment. 2½×2=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. 2½×2=5

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

2. (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

[Turn over

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

(b) List out various laboratory tests to analyse the properties of wastewater. 6

(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) Describe the Nitrogen Cycle with a neat schematic diagram. 6

(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. 14

5. (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. 8

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

6. (a) Determine the ultimate BOD for a sewage having 5 day BOD at 20°C as 200 ppm. Assume the de-oxygenation constant as 0.12 per day. Also determine the 2 day BOD for the Sewage. 8

(b) Describe the 1st stage BOD curve with the help of a neat schematic diagram. 6

(c) Define BOD, COD, TOD and ThOD. 1½×4=6