Code No: **R1641011** **R16** **Set No. 1**

IV B.Tech I Semester Regular/Suplementary Examinations, Jan/Feb - 2022

ENVIRONMENTAL ENGINEERING - II

(Civil Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B
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PART–A *(14 Marks)*

1. a) Classify sewage systems. [3]
   b) Differentiate between one pipe & two pipe system. [2]
   c) Mention the physical characteristics of sewage. [3]
   d) What are aerated Lagoons? [2]
   e) What are the operational problems of ASP? [2]
   f) What do you mean by self purification of streams? [2]

PART–B *(4x14 = 56 Marks)*

2. a) Design a sewer to serve a population of 36,000, the daily per capita water supply allowance being 135 lpcd of which 80% find its way into the sewer. The slop available for the sewer to be laid is in 625 & the sewer should be designed to carry 4 times the dry weather flow when running full what would be the velocity of flow in the sewer when running full? Assume h=0.012 in Manning's formula? [8]
   b) Discuss about cleaning and ventilation of sewers. [6]

3. a) Explain various systems of sanitary plumbing. Write down the main characteristics of each system. [7]
   b) Write about importance of house plumbing. [7]

4. Design a rectangular grit chamber for a flow of 40MLD, specific gravity=2.65 & size to be removed is 0.2mm. Find the (i) Settling velocity of 0.2mm particles, (ii) Critical horizontal velocity, (iii) size of the grit chamber. Assume kinematic viscosity of the liquid $=1.0x10^{-2}cm^2/s$. [14]

5. a) What are the mechanisms involved in trickling filter to remove the impurities. [7]
   b) Estimate efficiency of a 30m diameter & 1m deep single stage, high rate trickling filter for the following data [7]
   (i) Sewage flow = 4.5 MLD, (ii) Recirculation ratio = 1.4, (iii) BOD of raw sewage = 250mg/l, (iv) BOD removed in primary clarifier = 25%.

6. Design a septic tank for 200 persons with a water supply of 125 liter per capita per day. Assume any other data & mention it. [14]

7. Draw the neat sketch of anaerobic sludge digester & explain the process of anaerobic sludge digestion. Name the experiments to be performed in the laboratory to determine digestible of sludge. [14]