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

IV B.Tech I Semester Supplementary Examinations, February - 2020

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) What is known as Domestic Sewerage? [2]
   b) Explain the need for pumping stations in sewerage systems. [2]
   c) Mention the process of screening. [2]
   d) What is attached growth process? Give example which own using this process. [3]
   e) Which process is better aerobic treatment? [2]
   f) What is sewage thickness? [3]

PART–B *(4x14 = 56 Marks)*

2. A combined sewer is to be laid to serve an area of 100ha with a population of 90,000 supplied with water at 20lpcd. Assuming an impermeability factor of 0.50 & time of concentration of rainfall 't' as 20 minutes, calculate the size of the sewer when it has to run full with a velocity of 0.3m/s. [14]

3. a) Enumerate the factors to be considered for locating the pumping stations in sewerage systems? [7]
   b) Discuss the principles included in the planning and design of building drainage. [7]

4. a) Derive the mathematical expression for BOD. [7]
   b) Find the number of bars required in screening process to treat waste water whose discharge is 25MCD having suspended impurities of ϕ=10mm & spacing between the bars is 245mm. Approach velocity 1m/s. and the depth of screen =0.9m. Also find head loss if screen placed θ=60 to horizontal. [7]

5. a) Explain the principles involved in operating the activated sludge process and mention all its modifications with neat diagrams. [7]
   b) Determine the volume of aeration tank of ASP given the BOD of sewage as 150mg/l, MLSS=2550mg/l, R/M = 0.50 & Quantity of sewage is 5MCD? [7]

6. a) Write brief note on Nitrification & Denitrification process. [7]
   b) Draw the sketch of UASB & Explain its function with merits & demerits. [7]

7. Describe different zones of pollution in river stream? Explain the importance of re-oxygenation, de-oxygenation of oxygen deficit in problems of stream sanitation. [14]

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