Code No: **RT41011**   **R13**   **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, March - 2017
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 THREE questions from Part-B
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PART–A *(22 Marks)*

1. a) Write short note on manhole   [4]
    b) Differentiate between one pipe and two pipe system.   [4]
    c) Discuss the significance of BOD/COD ratio.   [3]
    d) Write brief note on Oxidation Pond.   [4]
    e) What is meant by nitrification and de- nitrification?   [3]
    f) Write about the importance of sludge thickening in sludge management.   [4]

PART–B *(3x16 = 48 Marks)*

2. a) Explain the systems of sanitation.   [8]
    b) Determine the size of a circular sewer for a discharge of 800 lps running half-full. Assume hydraulic gradient of 1 in 1250 and Manning's constant n=0.012.   [8]

3. a) Under what circumstances pumping of sewage is needed. Enumerate the problems faced during pumping of sewage.   [8]
    b) Explain the principles involved in designing of building drainage.   [8]

4. a) A 2% dilution of sewage sample is incubated for 5 days at 20°C. The depletion of oxygen was found to be 4 ppm. Determine the BOD_5 of sewage at 20°C. Calculate ultimate BOD and 2 day BOD at 35°C .   [8]
    b) Write short note on i) Screening and ii) Grit chamber   [8]

5. a) Design an Activated sludge plant to treat domestic sewage, based on the following data

Population	: 50,000
Average sewage flow	: 120 lpcd
BOD of sewage Influent	: 200 mg/lit
MLSS	: 2000 mg/lit
F/M ratio	: 0.3 [8]

    b) Explain with neat sketch the working principle of standard rate trickling filter.   [8]

6. a) Write in detail about the UASB reactor with neat sketch, advantages and disadvantages.   [8]
    b) Explain with neat sketch the working principle of septic tank.   [8]

7. a) Draw a typical oxygen sag curve and explain its significance in river pollution.   [8]
    b) Explain the term sewage sickness and its remedial measures.   [8]