

Code No: RT41011

R13**Set No. 1****IV B.Tech I Semester Supplementary Examinations, February/March – 2018****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*

PART-A (22 Marks)

1. a) Define the terms health and sanitation and discuss their relationship. [4]
- b) Write about type of pumps and assess their suitability in sewerage system. [4]
- c) Explain the need for sampling and analysis of sewage. Suggest important parameters. [4]
- d) With sketch, briefly explain the functioning of RBC. [4]
- e) What is meant by Nitrification and denitrification? [3]
- f) Discuss the role of sludge thickening in sludge handling. [3]

PART-B (3x16 = 48 Marks)

2. a) Estimate the Design peak flow of sewage and storm water flow in m³/sec for the given conditions: Area: 3Sq Km, Density of population: 250 per Hectare. Per capita water supply: 120lpcd Assume suitable data. [8]
- b) Write about the importance of sewer appurtenances in a Sewerage system. Mention them and indicate their role. [8]
3. a) Enumerate the role of pumping stations in sewerage system. Also mention the factors to be considered in location the pumping station. [8]
- b) Write about the importance of house plumbing. [8]
4. a) Define the terms: BOD, COD, and TOC. Discuss their importance in Sewage Treatment. [8]
- b) Develop a mathematical model for BOD (first order) and discuss the factors that influence BOD. [8]
5. a) Discuss the principle of Activated Sludge process. Also state different modifications of Activated Sludge Process. [8]
- b) Estimate the volume of Aeration Tank of Activated Sludge Process along with mechanical aerators capacity with the following Data: BOD₅@20°C-250mg/l, MLSS-3000mg/l, F/M ratio-0.20 and Flow – 10MLD. [8]
6. a) Explain the working of UASB with sketch. Also mention problems associated with UASB. [8]
- b) What is a septic tank? Design a two stage septic tank with soak pit disposal for 200 persons. Draw the sketch indicating the important components like inlet and outlet. Water supply may be assumed as 90 lpcd. [8]
7. a) ~~Explain the basic mechanism of functioning of Anaerobic Digester with neat sketch.~~ [8]
- b) Describe the thickening and dewatering in sludge handling. Draw the sketch of sludge drying bed. [8]