GUJARAT TECHNOLOGICAL UNIVERSITY
M.E Sem-I Regular Examination January / February 2011

Subject code: 711806N
Subject Name: Water and Wastewater Treatment Technologies

Date: 03 /02 /2011   **Time: 02.30 pm – 05.00 pm**
                                                                     Total Marks: 70

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** With the help of a neat sketch explain the treatment units of conventional water treatment plant along with important design parameters. **07**

(b) Give the difference between : **07**
  (i) Discrete settling and flocculant settling.
  (ii) Dilute suspension and concentrated suspension

Q.2 **(a)** (i) Enlist and explain the mechanisms of filtration in a Rapid Sand Filter. **07**
  (ii) Give the classification of Trickling Filter and explain any one in detail

(b) Distinguish between giving at least five points of difference: **07**
  (i) Coagulation and flocculation
  (ii) Rapid Sand filter and Slow sand filter

OR

(b) Explain the chemical reactions involved when the following chemicals are used for coagulation: **07**
  (i) Alum
  (ii) Ferrous sulphate and lime

Q.3 **(a)** Explain in brief the importance of following parameters, along with their sources, in water and wastewater : **08**
  (i) BOD.
  (ii) Phenolic compounds
  (iii) Fluorides
  (iv) Chlorides

(b) Differentiate between: **06**
  (i) Aerobic processes and anaerobic processes.
  (ii) Suspended growth and attached growth processes

OR

Q.3 **(a)** Explain the procedure to determine the bio kinetic constants for Activated Sludge Process in a laboratory. Prepare a table showing the monitoring schedule. **07**

(b) If the F/M ratio of a 0.4380 m^3/s activated sludge plant is 0.2 d^{-1}, the influent BOD_5 after primary settling is 125 mg/L and the MLVSS is 2500 mg/L, what is the volume of the aeration tank? **07**

Q.4 **(a)** Write the applications of sedimentation. **07**

(b) For a circular clarifier of 40 m diameter , determine the Weir Loading and surface loading rate for a wastewater flow of 10MLD **07**

OR

Q.4 **(a)** Explain different types of sedimentation tanks with sketch. **07**

(b) Assuming the diameter of a clarifier to be 20m and the wastewater flow rate **07** 10 MLD, calculate the detention time and surface loading rate of the clarifier having a wastewater depth of 2.4m.

Q.5 **(a)** Write a short note on Aerated Grit Chamber **07**
     (b) Which are the major factors which affect 'K' value in BOD test .Explain each **07** factor in detail.

<center>**OR**</center>

Q.5 **(a)** Write the applications of screens at Water Treatment Plant. **07**
     (b) A sample of wastewater was incubated for 7 days and the BOD was 490 mg/L. **07** Calculate the BOD_5 , BOD_{10} and ultimate BOD if $K=0.1 \ d^{-1}$

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