Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-IV Examination June- 2010

Subject code: 141304

Subject Name: Water Pollution & Control

Date: 21 / 06 /2010 **Time: 10.30 am – 01.00 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)** Define the terms: **10**
(i) Horizontal velocity (Flow through velocity)
(ii) Surface overflow rate
(iii) Food to Microbe ratio
(iv) Hydraulic loading rate
(v) Scour velocity

(b) Define Effective size (ES) and Uniformity Coefficient (UC) of sand. What should be the ES and UC for sand to be used in RSF ? **04**

Q.2 **(a)** Draw a neat sketch of conventional Waste water treatment plant and explain the different units. **07**

(b) (i) Explain the difference between secondary treatment and advanced waste water treatment. **07**
(ii) Differentiate between discrete settling and flocculant settling.

OR

(b) (i) Enlist and explain the functional zones of sedimentation tank. **07**
(ii) Give the classification of screens.

Q.3 **(a)** (i) Explain single stage and two stage trickling filter with sketch. **07**
(ii) Explain when anaerobic conditions are developed in a trickling filter.

(b) (i) A grit chamber has a wastewater depth of 0.9 m. Calculate the time required by a 0.2 mm sand particle to settle at the bottom. Also determine the length of chamber , if the flow through velocity is 0.3m/s. **07**
(ii) For a circular clarifier of 20 m diameter and 2.5 m wastewater depth with 10 MLD flow, determine detention time and surface overflow rate.

OR

Q.3 **(a)** Explain the sources and effects of following parameters in water and waste water: **07**
(1) Turbidity
(2) pH
(3) Fluorides

(b) Explain aerobic and anaerobic treatment processes. Highlight the adventages of anaerobic processes over aerobic processes. **07**

Q.4 **(a)** Explain with a neat sketch, construction and working of Slow Sand Filter. **07**

(b) (i) Differentiate between coagulation and flocculation. **07**
(ii) What is equalization? Explain its importance in waste water treatment.

OR

Q.4	**(a)**	Enlist and explain the effects of water pollution.	**07**
	(b)	Determine the quantity of alum required in order to treat 13 million litres of water per day at treatment plant, where 12 mg/L of alum dose is required. Also determine the alkalinity required.	**07**
Q.5	**(a)**	What is the purpose of Biological treatment of waste water? Differentiate between suspended and attached growth process.	**07**
	(b)	Draw a neat sketch of Activated Sludge Process and draw a neat sketch of it.	**07**

OR

Q.5	**(a)**	Write a note on "Control of Oil pollution".	**07**
	(b)	What is Thermal Pollution? Explain the harmful effects of thermal pollution.	**07**

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