Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER V • EXAMINATION – WINTER - 2012

Subject code: 151303 Date: 17-01-2013

Subject Name: Physico-Chemical Treatment Technologies

Time: 02:30 pm to 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)** Draw a neat sketch of conventional water treatment plant and explain the Function of each unit.	07
	(b) Explain the sources and effects of following parameters in water and wastewater: (i) Hardness (ii) Fluorides (iii) Alkalinity (iv) Nitrates	07
Q-2	(a) Explain the coagulation theory for removal of colloids	07
	(b) Give the classification of different types of filters and explain the multi media Filters.	07
	OR	
	(b) Explain the construction and working of a Slow Sand Filter along with a neat Sketch.	07
Q-3	(a) With the help of a neat sketch explain the concept of "Break point Chlorination."	07
	(b) Write a note on "Intensification of backwashing RSF".	07
	OR	
	(a) Explain the disinfectants used for water treatment.	07
	(b) Write a short note on "Tube Settlers".	07
Q-4	(a) Differentiate between : (i) Rapid mixer and flocculator (ii) Coagulation and flocculation (iii) Perikinetic and ortho kinetic flocculation	07
	(b) What are the functions of under drainage systems? Explain manifold and pipe lateral system of under drainage.	07
	OR	
	(a) Write a short note on "Colloidal Stability". What are the mechanisms of Destabilization of colloids?	07
	(b) Explain the ideal sedimentation concept and highlight the chief features of inlet and outlet structures	07
Q-5	(a) Determine the built up of head loss through a bar screen when 60% of the flow area is blocked off due to the accumulation of coarse solids. Assume the following conditions: (i) Approach velocity=0.6m/s (ii) Velocity through clean bar screen=0.9 m/s (iii) Open area for flow through clean bar screen=0.2m2 (iv) Head loss Coefficient for clean bar =0.7	07
	(b) Explain any one type of Grit Chamber with sketch.	07
	OR	
	(a) Describe the usual sources of sludge and the characteristics of sludge generated in a conventional wastewater treatment plant.	07
	(b) Describe the methods normally used to process the sludge before its final disposal.	07

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