Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER III (NEW) – EXAMINATION – WINTER-2016

Subject Code: 2731703 **Date:25/10/2016**

Subject Name: Treatment Process Design and Drawing

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 typical sketch for the major treatment units used in domestic water treatment plant along with their functions. Also draw a process flow diagram for the same.	**07**
	(b)	Explain the collections and conveyance systems used for water treatment.	**07**
Q.2	**(a)**	Discuss the factors affecting the selection of water treatment units.	**07**
	(b)	Explain the rural water supply in detail.	**07**
		OR	
	(b)	Describe various flow measuring devices.	**07**
Q.3	**(a)**	Describe the bars and screens used on water treatment plant.	**07**
	(b)	Explain various methods of filtration for water supplies.	**07**
		OR	
Q.3	**(a)**	Draw a neat process flow diagram of water treatment plant and show unit operations and unit processes.	**07**
	(b)	Explain the terms: Hydraulic retention time, organic loading rate, Food-microorganism ratio, silt density index	**07**
Q.4	**(a)**	Discuss the phenomenon of UFSBR.	**07**
	(b)	Design set of three rapid gravity filters for treating the water at a water works, which has to supply the water to a town of population 1,00,000. Per capita demand of the town is 270 litres/day. The rate of filtration of the rapid gravity filters may be taken as 4500 litres/hour/sq.m..	**07**
		OR	
Q.4	**(a)**	Discuss the design criteria for reverse osmosis.	**07**
	(b)	Describe the selection criteria for treatment units for surface water sources.	**07**
Q.5	**(a)**	Draw a neat process flow diagram of sewage treatment plant and show unit operations and unit processes.	**07**
	(b)	Design a facultative type aerated lagoon to provide post-treatment to 10,000 m^3/d UASB effluent with the following characteristics: (i) BOD to be reduce from 70 mg/L to 40 mg/L (ii) immediate Oxygen Demand caused by 20 mg/L of Sulphides (iii) Occasional solids carryover of 200 mg/L for 30 minutes.	**07**
		OR	
Q.5	**(a)**	Draw a typical sketch for major units for treatment of wastewater for your city. Put your expert comments for the same.	**07**
	(b)	Write short note on sequential batch reactor. Also discuss the pros and cons of SBR.	**07**

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