Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–IV EXAMINATION – WINTER 2015

Subject Code:X40601 **Date:18/12/2015**

Subject Name: Environmental Engineering

Time: 02:30pm to 05:00pm **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)**	Explain different factors affecting the water demand.	**07**
	(b)	Explain river intake with a neat sketch showing all the components.	**07**
Q.2	**(a)**	Explain with neat sketch septic tank and state its design criteria.	**07**
	(b)	Write Indian Standard Specifications for drinking water -IS 10500.	**07**
		OR	
	(b)	A rectangular sedimentation basin is to handle 12 MLD of raw water. A sedimentation basin of width to length ratio of 1/3 is proposed to trap all particles larger than 0.05 mm in size. Assume a relative density of 2.62 for particles and 20°C as the average temperature, determine the basin dimensions. If the effective depth of tank is 3 m, calculate the detention time.	**07**
Q.3	**(a)**	Enlist the different methods used for population forecast? Explain any two methods in detail.	**07**
	(b)	Design a bell mouth canal intake for a city of 1,00,000 persons drawing water from a canal which runs only for 10 hours a day with a depth of 1.8 m. Assume average consumption per person= 135 lpcd, assume the velocity through the screens and bell mouth to be 0.15 m/s and 0.3 m/s respectively.	**07**
		OR	
Q.3	**(a)**	Draw the neat sketch of domestic wastewater treatment plant and explain in detail its units.	**07**
	(b)	Calculate velocity of flow and corresponding discharge in a circular sewer having a diameter of 1.00 m and laid at a gradient 1 in 500. The sewer is running at 0.6 m depth. Take N = 0.012 in Manning's formula.	**07**
Q.4	**(a)**	Enlist the places where pumps have to be used in a water supply project. Also give the classification of different types of pumps used in water supply system.	**07**
	(b)	How do you determine the capacity of reservoir? Discuss the hydrograph method for determining the storage capacity of equalizing reservoir.	**07**
		OR	
Q.4	**(a)**	Define peak factor and explain its importance in design of sewers. How will you determine peak factor.	**07**
	(b)	Explain methods of disinfection.	**07**
Q.5	**(a)**	Describe with neat sketch, the component parts of a rapid sand gravity filter. Explain its working, including the method of back washing.	**07**
	(b)	Explain in brief 'nitrification" and "de nitrification".	**07**
		OR	
Q.5	**(a)**	Discuss with the help of diagrams, various methods of laying out the distribution system.	**07**
	(b)	Differentiate between trickling filter and activated sludge plant.	**07**

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