Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE VI- SEMESTER– • EXAMINATION – SUMMER 2015

Subject Code: 160604 Date: 14/05/2015

Subject Name: Water and Waste Water Engineering

Time: 10.30am-01.00pm 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)**	Define design period of water supply project and the factors affecting it. What is the design period of distribution system as recommended by GOI "Manual on water supply"?	**07**
	(b)	How do daily fluctuations in demand of water supply affect per capita demand? Show that maximum hourly consumption of maximum day is equivalent to 2.7 times the annual average hour demand.	**07**
Q.2	**(a)**	Compare simple graphical method and graphical comparison method for forecasting future population.	**07**
	(b)	Explain the working of lake intake structure with a neat sectional view.	**07**
		OR	
	(b)	What do you understand by dual system of water distribution? Explain with neat layout the suitability of grid iron system of water distribution network.	**07**
Q.3	**(a)**	Why plastic pipes are more commonly used now-a-days in water conveyance system than metallic pipes. Discuss its advantages and disadvantages also.	**07**
	(b)	Explain settling velocity of a discrete particle in water. Find the settling velocity of discrete particle of diameter $6x10^{-3}$ cm and specific gravity 2.65 having Reynolds's no. less than 0.5.and water temperature as 20^oC,Kinemetic viscosity of water at 20^oC is $1.01x10^{-2}$ cm^2/sec.	**07**
		OR	
Q.3	**(a)**	Compare Slow Sand Gravity Filter and Rapid Sand Gravity Filter.	**07**
	(b)	What do you understand by sedimentation with coagulant? Design the coagulation cum sedimentation tank for a water supply work treating water @ $850m^3$ /hr. Assume detention period of settling tank as 5 hrs and 30 min for floc chamber. The rate of flow is 950 lit/hr/m^2 of plan area.	**07**
Q.4	**(a)**	Explain how ozone is helpful in disinfecting water. Discuss its limitation also.	**07**
	(b)	Differentiate temporary and permanent hardness. Explain any one method of removing permanent hardness.	**07**
		OR	
Q.4	**(a)**	Explain in detail: "water carriage system of sanitation".	**07**
	(b)	Differentiate self cleaning velocity and limiting velocity in sewers. Design a circular sewer, running half full, to carry waste water at velocity of 1.8m/sec with a slope of 1 in 400. Take manning's n as 0.012.	**07**
Q.5	**(a)**	Mention the different types of storm water regulators used in a sewerage system. Explain any one in detail.	**07**

	(b)	State the functions of grit chamber in waste water treatment plant. Design a grit chamber with a proportional flow weir at its outlet to handle a sewage flow from population of 60,000. Assume Per capita daily consumption of water of 135 litres.	**07**

OR

Q.5	**(a)**	Write short notes on communitors and also explain the different ways of disposal of screenings.	**07**
	(b)	What is activated sludge process in waste water treatment plant? Explain step aeration and extended aeration process.	**07**

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