Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI(OLD) – EXAMINATION – SUMMER 2019

Subject Code:160604 Date:18/05/2019

Subject Name: Water & Waste Water Engineering

Time:10:30 AM TO 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)**	What are different water demands? Discuss factors affecting water demand	**07**
	(b)	Why is population forecasted for calculation of water demand? Differentiate arithmetic and geometric increase method of population forecast.	**07**
Q.2	**(a)**	Discuss theory of sedimentation and prove that settling velocity dose not depends on depth of sedimentation tank.	**07**
	(b)	Design the septic tank with soak pit for 150 users. Assume suitable data.	**07**
		OR	
	(b)	Describe different aerobic and anaerobic processes used to treat wastewater	**07**
Q.3	**(a)**	Differentiate dry well and wet well used for intake structure? Schematically describe reservoir and river intakes.	**07**
	(b)	What is discrete settling? Derive the equation for settling velocity for discrete particles in PST	**07**
		OR	
Q.3	**(a)**	Design a clariflocculator for discharge of 240 m3/hr	**07**
	(b)	Describe the working procedure of Rapid sand filter and Slow sand filter.	**07**
Q.4	**(a)**	Define velocity gradient and give the salient features and design criteria for flash mixer	**07**
	(b)	Draw the flow diagram of wastewater treatment plant and discuss the functioning of different units	**07**
		OR	
Q.4	**(a)**	Explain the mass curve method of finding capacity of ESR	**07**
	(b)	Compare gravity and pumping system of supply and explain any one water distribution network system in details	**07**
Q.5	**(a)**	What are sewer appurtenances? Describe purpose of manhole and drop manhole with sketches	**07**
	(b)	What is HRTF? Design HRTF for wastewater flow of 4.0 MLD with recirculation ratio=1.4, BOD of raw wastewater=250 mg/l and desired effluent BOD=40 mg/l	**07**
		OR	
Q.5	**(a)**	Enlist different methods of chlorination and discuss method of Break point chlorination with chemical reactions	**07**
	(b)	Why is sludge digestion required? Discuss the different factors affecting the sludge digestion process	**07**

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