Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– VI (New) EXAMINATION – WINTER 2019

Subject Code: 2161307   **Date: 12/12/2019**
Subject Name: Ground Water Contamination
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.**

			Marks
Q.1	(a)	Define the following terms. (1) Aquiclude (2) Aquifuge (3) Perched aquifer	03
	(b)	Explain in detail how to monitor groundwater quality.	04
	(c)	What is ground water? Discuss vertical distribution of ground water with neat Sketch.	07
Q.2	(a)	Write down the hydrological properties of water bearing strata.	03
	(b)	Explain in detail different sources responsible for ground water pollution with causes.	04
	(c)	Explain the recuperation test to estimate the safe yield of an open well.	07

OR

	(c)	Explain in detail steady & unsteady flow solution for fully penetration wells.	07
Q.3	(a)	Write the assumptions made in dupuit's theory.	03
	(b)	Explain the different methods of waste water recharge for reuse.	04
	(c)	Design a tube well for the following data.	07

1) yield required = 0.081cumsec
2) Thickness of confined aquifer = 30 m
3) Radius of circle influenced = 300 m
4) Permeability coefficient = 60 m/day
5) Draw down = 5.1 m

OR

Q.3	(a)	Explain induced recharge method with their flow pattern.	03
	(b)	A pumping test was conducted for an open well of diameter 3.6m. the water was pumped out at a constant rate of 300lit/min. find specific yield. Take h=3.5 m	04
	(c)	Water is pumped out at the rate of 2500 lit/min from a well of 0.3 m diameter, penetrating fully in an aquifer of 30 m thickness. The draw downs observed in two adjoining wells at 20 m and 120 m from the pumping well are 8 m and 0.6 m respectively. Determine the average hydraulic conductivity.	07
Q.4	(a)	What is cone of depression?	03
	(b)	Define following terms: (1) Porosity (2) Permeability (3) Transmissibility (4) Specific yield	04
	(c)	Derive the differential equation for Unconfined aquifer.	07

OR

Q.4	(a)	Write a short note on advective and dispersive transport mechanism	03

	(b)	Explain in detail method of images	**04**
	(c)	What is artificial recharge? Explain different artificial recharge methods of ground water.	**07**
Q.5	**(a)**	Give the difference between fully and partial penetrating wells.	**03**
	(b)	Explain site selection criteria for artificial recharge.	**04**
	(c)	Write down the Indian & international standards for ground water quality.	**07**

OR

Q.5	**(a)**	Explain Artificial recharge for "energy purpose".	**03**
	(b)	Explain the Darcy's law. What are its limitations? Discuss its validity.	**04**
	(c)	Explain in detail interference among wells.	**07**