Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – WINTER • 2013

Subject code: 1721201 **Date: 24-12-2013**

Subject Name: Ground Water Management

Time: 10.30 am – 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)**	Explain different types of aquifers with sketches.	**07**
	(b)	What are the aquifers parameters? Explain how they are determined.	**07**
Q.2	**(a)**	Describe different types of methods for measurement of yield of underground water sources.	**07**
	(b)	Write notes on development of ground water.	**07**
		OR	
	(b)	Discuss the need for geophysical methods in ground water exploration. Compare resistivity method and seismic method.	**07**
Q.3	**(a)**	Derive the continuity equation for the three dimensional unsteady state ground water flow in a confined aquifer.	**07**
	(b)	Enumerate the different types of tube well and discuss any one in details with sketch.	**07**
		OR	
Q.3	**(a)**	Write short notes on construction and maintenance of wells.	**07**
	(b)	What is artificial recharge of aquifers? Explain different methods of artificial recharge of aquifers in brief.	**07**
Q.4	**(a)**	Explain ground water basin management.	**07**
	(b)	Write assumptions and limitations of analysis of steady and unsteady radial flow to wells.	**07**
		OR	
Q.4	**(a)**	Explain electrical analogy models in ground water and write practical comparison of Darcy's and Ohm's law.	**07**
	(b)	Define sea water intrusion. Explain prevention control of sea water intrusion.	**07**
Q.5	**(a)**	Discuss the important contaminants that may be present in a polluted ground water environment. Examine the possible sources of these contaminants.	**07**
	(b)	Discuss the particle tracking method to study the pollution of ground water environment.	**07**
		OR	
Q.5	**(a)**	Derive the equation to establish the relationship between the length of the interface and outflow to the sea in unconfined coastal aquifer.	**07**
	(b)	Write short notes on numerical modeling of ground water systems.	**07**

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