Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1721201 **Date: 16-06-2014**

Subject Name: Ground Water Management

Time: 02:30 pm - 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.**

Q.1 **(a)** Explain the theory of Image well. **07**

(b) Write Dupuitôs assumptions and derive an equation for discharge and drawdown in well for unconfined aquifer. **07**

Q.2 **(a)** Explain Chawôs method for determining parameters S and T. **07**

(b) Define permeability and discuss the factors affecting permeability. **07**

OR

(b) Explain ground water basin management. **07**

Q.3 **(a)** Explain laboratory methods for determination of permeability. **07**

(b) A 30cm. well penetrates 40m below the static water table. After a long period of pumping at a rate of 1500 lpm, the draw downs in the wells at 19m. and 50m. from the pumped well were 4m and 2.5m respectively. What is the co.efficient of permeability of aquifer and drawdown in the well. Also determine specific capacity of the well and height of seepage surface in the well. **07**

OR

Q.3 **(a)** Write short notes on construction and maintenance of wells. **07**

(b) A 30cm well 80m deep is proposed in an aquifer having a transmissibility of 1.5×10^5 lpd/m and a co-efficient of storage of 0.0004. The static water level is expected to be 20m below ground level. Assuming a pumping rate of 2000 lpm. What will be the drawdown in the well after (i) 1 yrs (ii) 2 yrs. **07**

Q.4 **(a)** Discuss the movement of ground water and its governing law and also its limitations. **07**

(b) A pump test was conducted on a leaky artesian aquifer 30m thick situated on an impervious base and overlain by a semi confining layer 10m thick. The well was pumped at a constant rate of 1600 lpm. The steady state drawdown in the observation wells are given below. Determine the aquifer constants. **07**

Distance of observation well from the pumped well (m)	10	20	60	100	300
Drawdown (m)	0.64	0.52	0.36	0.24	0.07

OR

Q.4 **(a)** How remote sensing play a vital role in ground water exploration? **07**

	(b)	Rainfall at the rate of 10 mm/hr falls on a strip of land 1 km wide lying between two parallel canals with 2 m difference in their water surface levels. It is underlain by a horizontal impermeable stratum at 10 m below the water surface of the lower canal. Assuming a permeability of 12 m/day with vertical boundaries and all the rainfall in filters into the soil, compute the discharge per meter length into both the canals.	**07**
Q.5	**(a)**	Discuss remedial measures to prevent sea water intrusion.	**07**
	(b)	Write in details: (i) Theis recovery method (ii) Ground water legislation.	**07**
		OR	
Q.5	**(a)**	Discuss the particle tracking method to study the pollution of ground water environment.	**07**
	(b)	Derive the equation to establish the relationship between the length of the interface and outflow to the sea in unconfined coastal aquifer.	**07**

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