

B. Tech. 8th Semester (Electives) Examination,**December-2011****GROUND WATER ENGG.****Paper-CE-426-E***Time allowed : 3 hours]**[Maximum marks : 100*

Note : Attempt any five questions. All questions carry equal marks.

1. (a) Explain ground water theory with compressibility of aquifers. 10
(b) "The coefficient of storage of an artesian represents the entire thickness of the aquifer, where as the coefficient of storage of a free aquifer does not" – Explain. 10
2. (a) What is ground water exploration and what are its various methods of investigations ? Explain any two methods in detail. 10
(b) What are the assumptions in the Thiem's equations ? 5

- (c) Define specific yield. What is the relation between porosity and specific yield ? 5
3. (a) What is leaky artesian aquifer ? Explain with sketch. 10
- (b) A 30 cm well fully penetrates as confined aquifer 30m deep. After a long period of pumping at a rate of 1200 lpm, the drawdowns in the wells at 20 and 45m from the pumping well are found to be 2.2 and 1.8 m resp. Determine the transmissibility of the aquifer. What is the drawdown in the pumped well ? 10
4. (a) Describe briefly the image well theory. 5
- (b) An aquifer is bounded by two converging boundaries at an angle of 36° , one being a barrier boundary and the other a recharge boundary. Compute the number of image wells and mark them neatly in a sketch. 10
- (c) Write a short note on tile drain problem. 5

5. (a) What are the various types of tubewells ? What are the advantages and disadvantages of using tubewells. 10
- (b) Calculate the specific capacity of an open well from the following data,
Initial depression head = 5m
Final depression head = 2m
Time of recuperation = 2 hrs
Diameter of well = 3m
Calculate also the specific yield and yield of the well under head of 3m. 10
6. (a) What are the causes of failure of tubewells and how failure can be prevented ? 10
- (b) What is development of well ? Why and how it is done ? 10
7. (a) What is ground water recharge ? What are the favourable conditions for it ? 10

- (b) What are the various methods used for artificial recharge of wells ? Explain any two methods in detail. 10

8. Write a short note on : $4 \times 5 = 20$

- (a) Design of tubewell assembly.
- (b) Effect of boundaries on aquifers.
- (c) Recharge wells.
- (d) Properties of aquifers.