

Roll No. ....

2634

B. Tech. 8th Semester(Electives)

Examination – May, 2011

GROUND WATER ENGINEERING

Paper : CE-426-E

Time : Three hours ]

[ Maximum Marks :100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

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

1. (a) What is ground water engineering. & What are its objectives ? 10
- (b) Explain equation of motion for steady ground water flow in isotropic aquifers. Also explain Dupit's assumptions. 10
2. (a) What are the limitations so that non equilibrium equation can be applied to unconfined aquifers ? 5
- (b) Explain the effect of boundaries on aquifers. 5

- (c) A 30 cm well penetrates 50m below the static water table. After the long period of pumping at a rate of 1800 Lpm, the drawdowns in the wells at 15 and 45m from the pumped well were 1.7 and 0.8m resp. Determine the transmissibility of the aquifer. What is the drawdown in the pumped well. 10
3. (a) Define the term pump. What are the various types of pumps ? Explain in detail. 10
- (b) What are the various types of tube wells ? Explain in detail with neat sketch a section of deep tube well. 10
4. (a) Distinguish between specific yield and specific capacity 3
- (b) A tube well penetrates completely a confined aquifer. Determine the diameter of the tube well from the following data. 10
- (i) Required yield = 100 lits/ sec
  - (ii) Radius of cricle of influence = 200m
  - (iii) Thickness of confined aquifer = 30m
  - (iv) Drawdown = 5m
  - (v) Coefficient of permeability = 60m/day
- (c) What is shrouding ? Why & how it is done ? 7

5. (a) What are the factors which lead to diminishing opportunity for natural recharge of ground water basins ? 5
- (b) What are the various methods of artificial recharge ? Explain in detail. 10
- (c) Write a short note on induced infiltration technique for artificial recharge of ground water basins. 5
6. (a) Explain unconfined flow with a recharge 10
- (b) Explain the following terms: 10
- (i) Formation constant
  - (ii) Hydraulic resistance
  - (iii) Transmissibility
7. (a) What are aquifer hydraulic properties & how they are determined ? 10
- (b) A 40 cm well penetrates an aquifer of 30m thickness and the length of the screened portion is 10m. The yield is 2000 Lpm with a drawdown in well of 3m. If the length of the screen is increased by 20m, what will be the drawdown in the well & the increase in the specific capacity. 10
8. (a) Explain construction & working of tubewells. 10
- (b) What are the causes of failure of tube wells & what are their remedies ? 10
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