

Roll No.

24516

B. Tech. 7th Semester (Civil Engg.)

Examination – December, 2014

GROUND WATER ENGINEERING

Paper : CE-453-F

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 five questions in all, selecting one question from each Section. Question No. 1 is compulsory. All questions carry equal marks. Assume missing data, if any, suitably.

1. Define the following hydrological parameters :

8 × 2.5 = 20

(i) Dupit's assumptions and its importance

(ii) Well sickness

(iii) Difference between confined and unconfined aquifer

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- (iv) Types of tube well
- (v) Enumerate recharge techniques
- (vi) Perched water table
- (vii) Compressibility of aquifer
- (viii) Necessity of strainer in tube well

SECTION – A

- 2. (a) Describe formation constants of aquifer. Explain the properties of an aquifer in detail. 10
- (b) Explain ground water exploration. Describe various methods of investigations. 10
- 3. Derive an equation for steady and unsteady ground water flow in isotropic homogeneous aquifer. 20

SECTION – B

- 4. (a) Describe the effect of boundaries and interference of water. 10
- (b) Describe non equilibrium formula for aquifer of unsteady radial flows. 10

5. (a) Derive Thiem's equilibrium formula for confined and unconfined aquifer. 10
- (b) Define spherical flow in a well and partial penetration of an aquifer. 10

SECTION – C

6. Explain the construction and working of tube wells. What are the different methods used for drilling operation? Explain in detail. 20
7. (a) Explain different types of tube wells in detail. Also describe different types of strainer used in constructing tube well. 10
- (b) What do you mean by "verticality and alignment of tube well" and "corrosion and failure of tube well"? Explain in detail. 10

SECTION – D

8. (a) Define artificial recharge of ground water and its importance. Describe different recharge techniques in detail. 10
- (b) Explain in detail the induced infiltration method of artificial ground water recharge. 10

9. (a) Briefly describe recharge pits, shafts and recharge wells. 10
- (b) What are the various methods of water spreading in artificial recharge ? 10

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