

- (b) Write short notes on : 10
- (i) Development of the well
- (ii) Corrosion & failure of tubewell

7. (a) Enumerate the different methods which are used for drilling tubewells ? Discuss any one in detail. 10
- (b) With the help of neat sketch explain setting well screen by pull-back method & open hole method. 10

**SECTION – D**

8. (a) Write short note on necessity of ground water recharge. 10
- (b) Explain Ditch & Flooding method of ground recharge. Also make neat sketch. 10
9. Write short notes on :
- (a) Recharge induced by well 10
- (b) Basin type recharge method 10

Roll No. ....

**24516**

**B. Tech. 7th Semester (Civil Engg.)  
Examination – June, 2016**

**GROUND WATER ENGG.**

**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 : There are 9 questions in all. Question No. 1 is compulsory & students have to attempt one question from each of the four Sections.*

1. (a) Define transmissibility.  $2 \times 10 = 20$
- (b) What is drawback of equilibrium formula given by Thiem ?
- (c) What are different types of aquifer ?
- (d) Mention the reasons for failure of tubewell.

- (e) List various methods of ground water recharging.
- (f) How aquifer constants S & T are determined ?
- (g) What is principle objective of ground water studies ?
- (h) List the assumptions in the Theis equation.
- (i) What is unsteady flow condition ?
- (j) Mention different types of tubewells.

### SECTION – A

- 2. (a) What are various aquifer properties ? Explain in detail. 10
- (b) Explain various methods of ground water exploration & investigation. 10
- 3. (a) A 30 cm well penetrates 50m below the static water table. After a long period of pumping at a rate of 1800 lpm, the drawdown in the wells at 15 & 45 m from the pumped well were 1.7 & 0.8 m resp. Determine the transmissivity of the aquifer. What is drawdown in the pumped well ? 10
- (b) Derive the ground water flow for steady flow in isotropic homogenous aquifer. 10

### SECTION – B

- 4. (a) Explain the effect of various non-dimensional parameters  $\left(\alpha, \frac{R}{rw}, \frac{b}{rw}, \frac{\ell}{rw}, \frac{b}{R}\right)$  on the discharge & drawdown for partial penetration of the well. 10
- (b) What do you mean by spherical flow ? Why this type of flow is not used in practical ? 10
- 5. (a) With the help of neat sketch explain partial penetration of an aquifer by a well. 10
- (b) From the pumping tests of a semiconfined aquifer of thickness 30 m & permeability 20 m/d, it is estimated that the recharge rate from an overlying unconfined aquifer through an aquitard of thickness 2m, is 50 mm/year. The average piezometric surface in semiconfined aquifer is 16 m below WT in the unconfined aquifer. Determine the hydraulic characteristics of the aquifer & aquitard (Semi-confining layer). 10

### SECTION – C

- 6. (a) How do you ensure that 'tubewell construction' has been satisfactory ? Describe any test you would conduct for this purpose. 10