

B.Tech. (Civil) Elective - IV
7th Semester (G - Scheme)
Examination, December-2022
GROUND WATER ENGINEERING
Paper - PEC-CEEL-413-G

Time allowed : 3 hours / Maximum marks 75

Note:

- (i) Question no. 1 is compulsory.
- (ii) Attempt one question from each section.
- (iii) All questions carry equal marks.
- (iv) Assume missing data, if any, suitably.

1. Describe the following :

- (a) Groundwater balance
- (b) Well loss coefficient
- (c) Gravel packing
- (d) Differentiate confined and unconfined aquifer
- (e) Optimum capacity of well
- (f) Seawater intrusion

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2. (a) What are the characteristics of groundwater? Describe different methods to explore groundwater. 10

(b) Describe briefly groundwater table fluctuation and its interpretation. 5

3. (a) What are the different water bearing formations? Describe in detail the different aquifer properties. 10

(b) What are the important issues of groundwater management? Describe in detail. 5

Section - B

4. (a) What are Dupit's assumptions? Derive equilibrium equation for confined and unconfined aquifer. 7

(b) A 30 cm diameter well completely penetrates a unconfined aquifer of saturated depth 40 m. after a long period of pumping at a steady rate of 1500 lit/min, the drawdown in two observation wells 25 m and 75 m from the pumping well were found to be 3.5 m and 2.0 m respectively. Calculate the transmissibility of the aquifer. Also determine the drawdown at the pumping well. 8

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5. (a) Describe with a neat sketch the Chow method for determining the aquifer parameters. 7
- (b) What do you mean by residual drawdown? Briefly describe the recovery of piezometric head and recovery test. 8

Section - C

6. (a) What do you mean by open wells in unconsolidated formations? Briefly describe the sanitary protection of open wells. 8
- (b) Describe the water withdrawal for different purposes. 7
7. (a) What is the use of strain in tube wells? Explain in detail the different types of strain with neat sketches. (5) 10
- (b) Briefly describe well sickness and development of well. (3) 5

Section - D

8. (a) What is seawater intrusion? Describe in detail the groundwater basin management and conjunctive use of groundwater. 10
- (b) Write a short note on aquifer storage and recovery. 5

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9. Write a short note the following:

- (a) Recharge pits
- (b) Induced infiltration
- (c) Modification of natural channel
- (d) Ditching
- (e) Recharge wells

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