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(2066)

16427(J)

M. Tech 2nd Semester Examination
Ground Water and Ground Water Modelling

WRE-203

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt one questions from each sections A, B, C and D.
Section E is compulsory.

SECTION - A

1. (a) Explain the hydrogeological condition responsible for groundwater occurrence and movement. (10)
(b) Illustrate the Darcy's law and its application and limitations. (10)
2. (a) Describe the role of base flow in hydrological cycle. (8)
(b) Explain the ground water flow in fractured rock considering the Dupits's assumptions. (12)

SECTION - B

3. Describe the Step Drawdown Test (SDT), its components and application. (20)
4. Explain the Jacob's method for aquifer parameters determination for unconfined aquifer and its limitations. (20)

SECTION - C

5. Illustrate the procedure for construction of tubewell in boulder and soft rock formations. (20)

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6. (a) Explain the role of well design for longer life of tubewell. (10)
(b) Describe the methods for selection of slot size in well assembly. (10)

SECTION - D

7. (a) Describe the groundwater assessment-1997 methodology to estimate the ground water budget using water level fluctuation method. (10)
(b) Explain the criteria for categorisation of dynamic ground water resource and their importance. (10)
8. (a) Design a rooftop rainwater harvesting for building which has following details; Roof area: 1400Sqm, rainfall intensity: 35mm/hr, intake capacity of recharge well: 125 litre per minute. (10)
(b) Describe the need and scope of artificial recharge in hilly area. (10)

SECTION - E

9. Write short notes on followings:
 - (a) Leaky aquifer
 - (b) Relation between Transmissivity and nature of aquifer.
 - (c) Application of well loss and formation loss.
 - (d) Role of drilling fluid in well construction.
 - (e) Difference between Turbine and submersible pumps.
 - (f) Concept of Slug test to estimate Transmissivity and Storability.
 - (g) Application and limitation of finite element method under groundwater modelling.
 - (h) Waterlogging and soil salinity.
 - (i) Gabion water conservation method.
 - (j) Gravel packed well. (20)