

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 100857

Roll No.

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B.TECH.

Theory Examination (Semester-VIII) 2015-16

GROUND WATER MANAGEMENT

Time : 3 Hours

Max. Marks : 100

Section-A

Q1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)

- (a) What are the components of hydrological cycle?
- (b) Define Darcy's law.
- (c) Differentiate aquitard and aquiclude.
- (d) What do you mean by specific capacity?
- (e) List out the types of water wells.
- (f) What is meant by Groundwater irrigation?

- (g) What are the sources of contamination of groundwater?
- (h) What are the mechanisms involved in the reduction of pollutants in groundwater?
- (i) List out the types of Groundwater models.
- (j) The water budget terms for a lake includes precipitation of 43 inch/yr, evaporation of 53 inch/yr, surface water inflow of 1 inch/yr, surface outflow of 173 inch/yr and change in lake volume of -2 inch/yr. Determine the net groundwater flow.

Q2. Attempt any 5 questions from this section. (10×5=50)

- (a) Explain in detail about the forms of subsurface water with neat sketch.
- (b) A well 0.5 m in diameter penetrates 33 m below the static water table. After a long period of pumping at a rate of 80 m³/hr, the drawdown in wells 18 and 45 m from the pumped well were found to be 1.8 and 1.1 m respectively.
- (i) What is the transmissivity of the aquifer?

- (ii) What is the approximate drawdown in the pumped well?
- (iii) Determine the radius of influence of the pumping well.
- (c) Explain in detail about Well Hydraulics.
- (d) Write a short note on protection of water wells.
- (e) Discuss in detail about the remediation of contaminated Groundwater.
- (f) Explain various techniques used for rainwater harvesting.
- (g) Describe the application of GIS and remote-sensing techniques in groundwater management.
- (h) What is meant by artificial recharge and discharge of groundwater? Explain in detail.

Section-C

Note: Attempt any 2 questions from this section.

(15×2=30)

Q3. With a neat sketch, explain the following in detail :

- (a) Confined and unconfined aquifers
- (b) Design of water wells

Q4. Explain in detail about :

- (a) Dupuits theory
- (b) Well losses

Q5. Give a description about the following methods with diagram :

- (a) Electrical resistivity method
- (b) Seismic refraction method for groundwater exploration.

