

- (b) For a productive alluvial aquifer with hydraulic conductivity of 75 m/day and a hydraulic gradient of 0.01, calculate specific discharge. (6)
8. (a) Explain surface-based resistivity methods of groundwater exploration. (9)
- (b) Discuss the concept of groundwater recharge and its role in groundwater level fluctuation. (9)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4099

H

Unique Paper Code : 2192012402

Name of the Paper : Hydrogeology

Name of the Course : **B.Sc. (H) Geology, II Year**

Semester : IV

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. All questions carry equal marks.
3. Attempt any five questions.

1. (a) What is the scope of hydrogeology? How does it contribute to our understanding and management of groundwater resources? (9)
- (b) Explain the vertical distribution of subsurface water with the help of neat, labeled sketches. (9)

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2. Write short notes on : (6×3=18)

- (a) Water balance and water budget.
- (b) Ground water flow rate with respect to different geologic materials.
- (c) Saline water intrusion in coastal aquifer.

3. List and define the different types of water. Explain at length the concept of hydro logic cycle with special emphasis on the groundwater component with neat, schematic diagrams. (18)

4. (a) With a neat sketch, explain radius of influence, drawdown and cone of depression in a pumping well. (9)

(b) What is rainwater harvesting? What are the benefits and challenges associated with rainwater harvesting in urban and rural settings? (9)

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5. Differentiate between (any three) : (6×3=18)

- (a) Storativity and Specific Storage
- (b) Hydraulic Conductivity and Transmissivity
- (c) Porosity and Specific Retention
- (d) Confined and Unconfmed Aquifer

6. (a) What are the different chemical and physical properties that are used to quantify groundwater quality? (9)

(b) What is Piper diagram? How is it used to depict chemical composition of groundwater? (9)

7. (a) Explain Darcy 's law with the help of suitable sketches. What are the conditions under which the law is valid? Elaborate on the relation between Darcian flux and average linear velocity. (12)

P.T.O.