

Integ M.Sc. in App Geo Sem-6 Examination

AGL 310

Hydrogeology

April 2022

[Max. Marks : 50]

Time : 2-00 Hours]

Instructions: All questions in Section-1 carry equal marks
 Attempt any **three questions** (including A & B) in Section-1 and draw appropriate sketches wherever required
 Questions in **Section 2** is **COMPULSORY**

Section-1 Descriptive type questions

- Q-1A.** Describe the water distribution (approximate percentages) of Earth's Water in various broad reservoirs. 7
- Q-1 B.** Draw the flow diagram showing various water reservoirs and processes of water movement between those reservoirs. 7
- Q-2 A.** Define aquifer. What are confined and unconfined aquifers? Describe briefly about various confining layers in a confined aquifer. 7
- Q-2 B.** Briefly discuss about Infiltration, gravity drainage. 7
- Q-3 A.** Define the concepts of *Transmissivity*, *Storativity* and *Specific storage* of the aquifer characteristics. 7
- Q-3 B.** Explain the differences between overland flow, interflow and base flow. 7
- Q-4 A.** What are gaining and losing streams? In what kind of geographical regimes they can be found? Explain in details with diagrams. 7
- Q-4 B.** Define Porosity of an earth material? How porosity is calculated in laboratory? Write formulas for calculating porosity and total porosity. 7
- Q-5 A.** In a given porous rock volume; explain: Specific yield and Specific retention, with the suitable diagram. 7
- Q-5 B.** Explain Darcy's law with experiment setup diagram and formulas. What is specific discharge? 7
- Q-6 A.** From Darcy's and Hubbert's experiment, derive the relation between hydraulic conductivity and intrinsic permeability. Name each notions used in the equations. 7
- Q-6 B.** Briefly discuss about evaporation, transpiration and evapotranspiration. 7

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Q-7 A. What are permeameters used for in the laboratory. Explain the apparatus of *constant-head permeameter* with the help of diagram. 7

Q-7 B. Briefly discuss the classification of water beneath the land surface. 7

Section-2 Multiples Choice Questions

1. The instrument used for measuring evapotranspiration is: 1
A) Hygrometer B) permeameter C) lysimeter D) luxmeter
2. Infiltration capacity of soil depends upon the 1.5
A) Shape and size of soil particles
B) Arrangement of soil particles
C) Number of voids present in the soil
D) All of the Above
3. The change in the head per unit distance is: 1.5
A) The equipotential gradient
B) The hydraulic gradient
C) The flow gradient
D) The Hydraulic head
4. The rate of groundwater movement is governed by the: 1.5
A) Hydraulic conductivity of an aquifer
B) Hydraulic gradient.
C) Storage capacity of an aquifer
D) Both (A) and (B)
5. Isohyets are the imaginary lines joining the points of equal 1
A) Pressure
B) Height
C) Humidity
D) Rainfall
6. Pick up the correct statement from the following: 1.5
A) A confined bed of impervious material laid over an aquifer, is known as an aquiclude
B) The top most water bearing strata having no aquifer, is known as non-artesian aquifer
C) The ordinary gravity wells which supply water from the top most water bearing strata, are called water table wells
D) All the above

