

QUESTION – 1 Write the following

- i. Describe the water distribution (approximate percentages) of Earth's Water in various broad reservoirs. 7
- ii. Draw the flow diagram showing various water reservoirs and processes of water movement between those reservoirs. 7

OR

- i. Define aquifer. What are confined and unconfined aquifers? 7
- ii. Briefly discuss about Infiltration and gravity drainage. 7

QUESTION – 2 Write the following

- i. Define the concepts of *Transmissivity*, *Storativity* and *Specific storage* of the aquifer characteristics. 7
- ii. Explain the differences between overland flow, interflow and base flow. 7

OR

- i. What are gaining and losing streams? In what kind of geographical regimes, they can be found? Explain in detail with diagrams. 7
- ii. Define Porosity of an earth material? How porosity is calculated in laboratory? Write formulas for calculating porosity and total porosity. 7

QUESTION – 3 Write the following

- i. In a given porous rock volume; explain: Specific yield and Specific retention, with the suitable diagram. 7
- ii. Explain Darcy's law with experiment setup diagram and formulas. What is specific discharge? 7

OR

- i. From Darcy's and Hubbert's experiment, derive the relation between hydraulic conductivity and intrinsic permeability. Name each notion used in the equation. 7
- ii. Briefly discuss about evaporation, transpiration and evapotranspiration. 7

QUESTION – 4 Write the following

- i. What are permeameters used for in the laboratory. Explain the apparatus of *constant-head permeameter* with the help of diagram. 7
- ii. Briefly discuss the classification of water beneath the land surface. 7

OR

- i. Describe briefly about various confining layers in a confined aquifer with the help of diagram. 7

- ii. Draw a hypothetical storm hydrograph for a period of evenly distributed precipitation, separated into overland-, base-, inter- flows and direct precipitation. 7

Question - 5 Attempt any seven out of twelve (MCQs and one or two line answers)

- i. The instrument used for measuring evapotranspiration is: 2
 A) Hygrometer B) permeameter C) lysimeter D) luxmeter
- ii. Infiltration capacity of soil depends upon the 2
 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
- iii. The change in the head per unit distance is: 2
 A) The equipotential gradient
 B) The hydraulic gradient
 C) The flow gradient
 D) The Hydraulic head
- iv. The rate of groundwater movement is governed by the: 2
 A) Hydraulic conductivity of an aquifer
 B) Hydraulic gradient.
 C) Storage capacity of an aquifer
 D) Both (A) and (B)
- v. Isohyets are the imaginary lines joining the points of equal 2
 A) Pressure
 B) Height
 C) Humidity
 D) Rainfall
- vi. Pick up the correct statement from the following: 2
 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
- vii. Describe Absolute humidity. 2
- viii. What is the unit of specific discharge? 2
- ix. Describe wilting point of soil. 2
- x. Describe difference between Phreatophytes, Xerophytes, Hydrophytes plants. 2
- xi. Which department of Ministry of Jal Shakti look after and ensures the quality of drinking water. 2
- xii. What is the main source of energy that drives the whole hydrological cycle on the earth surface. 2