

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

Paper ID : 2295023

Roll No.

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B.TECH.

Regular Theory Examination (Odd Sem-VII), 2016-17

ENGINEERING HYDROLOGY

Time : 3 Hours

Max. Marks : 100

Note : Attempt all Section. If require any missing data; then choose suitably.

SECTION - A

1. Attempt all question in brief. (10×2=20)
- Define depression storage.
 - What do you mean by permanent wetting point?
 - What is subsurface runoff?
 - Write the different forms of precipitation.
 - What is specific capacity?
 - Write down Inglis formula
 - Define synthetic unit hydrograph
 - Distinguish between water table and piezometric surface
 - What do you mean by rain water harvesting?
 - What is the well loss?

SECTION - B

2. Attempt any three of the following : (3×10=30)
- Define the Hydrology and discuss critically the statement "Knowledge of Hydrology is a must for any water resource planning".
 - The following are the rates of rainfall for successive 20 minutes period of a 140 minutes storm : 2.5, 2.5, 10.0, 7.5, 1.25, 1.25, 5.0 cm/hr. Taking the value of π index as 3.2 cm/hr, find out the net runoff in cm, the total rainfall and value of Windex.
 - Explain with the help of neat sketches, the flow duration curve method and mass curve method to measure the runoff.
 - What do you mean by design flood? What are the factors affecting the flood hydrograph? Explain the procedure of using a unit hydrograph to develop the flood hydrograph due to a storm in a catchment.
 - Write short notes on any **four** of the following :
 - Well losses
 - Specific capacity and specific yield of an aquifer
 - Rain water harvesting
 - Aquifer and aquiclude
 - Radius of influence and cone of depression.

SECTION - C

3. Attempt any one part of the following : (1×10=10)
- What is meant by hydrological cycle? How can the parameters of the cycle be written in an equation form? Draw a neat diagram to illustrate your answer.

- Explain briefly the types of rain gauges.
A one-day rainfall of 100 mm at a station was found to have a return period of 50 years. Determine the probability that a one-day rainfall of this or larger magnitude will occur atleast once in 20 successive years.
4. Attempt any one part of the following : (1×10=10)
- Define evaporation. Discuss the factors that affect the evaporation from a water body.
 - Distinguish between :
 - Infiltration capacity and Infiltration rate
 - Actual and Potential evapotranspiration
 - Field Capacity and permanent wilting point
 - Depression storage and interception.
5. Attempt any one part of the following : (1×10=10)
- Write in brief the SCS-CN method for estimating the runoff volume. The peak of flood hydrograph due to a 3-h duration isolated storm in a catchment is 270 m³/s. The total depth of rainfall is 5.9 cm. Assuming an average infiltration loss of 0.3 cm/h and a constant base flow of 20 m³/s, estimate the peak of the 3-h hydrograph (UH) of this catchment. If the area of the catchment is 567 km²; determine the base width of the 3-h unit hydrograph by assuming it to be triangular in shape.

- b) What is hydrograph? Draw a single peaked hydrograph and explain its components.
6. **Attempt any one part of the following : (1×10=10)**
- a) What do you mean by hydrologic reservoir routing? Describe any two methods of hydrologic reservoir routing.
- b) Explain the terms risk, reliability and safety factor. A factory is proposed to be located on the edge of the 50 year flood plain of a river. If design life of factory is 25 years, what is the reliability that it will not be flooded during its design life?
7. **Attempt any one part of the following : (1×10=10)**
- a) Describe various types of tubewells.
- b) What are the differences between confined and unconfined aquifers for the determination of discharge with steady flow condition? A well penetrates into an unconfined aquifer having a saturated depth of 100 m. The discharge is 250 litres per minute at 12 m drawdown. Assuming equilibrium flow conditions and a homogeneous aquifer, estimate the discharge at 18 m drawdown. The distance from the well where the drawdown influences are not appreciable may be taken equal for both cases.

