

TCE 503

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Odd Semester Examination, 2019-20

B. Tech: Civil (5th Semester)

Hydrology

Time: 3:00hr

M.M:100

Total no. of printed pages: 2

Note : (i) Attempt ALL questions.
(ii) Assume any missing data suitably.

Q1. Attempt any four of the following **4X5=20**

- Explain "Hydrological cycle" with neat sketch.
- Give definitions:
Hydrology, Precipitation, Evapo transpiration, Run off, Interception.
- Explain with sketch non-automatic type of rain gauge. (Symon's rain gauge)
- What is S curve hydrograph?
- Define the term "Evaporation". Describe the factors affecting for evaporation losses.
- Give short note on:
 - Depth area duration curve
 - Double mass curve

Q2. Attempt any two of the following **4X5=20**

- What is unit hydrograph? What are the limitations of unit hydrograph?
- Explain: Unit Hydrograph (UH). What are the assumptions in UH theory?
- Why Rainfall-Runoff relationship is necessary? Justify
- Explain how will you find out missing rainfall data?
- The watershed at a particular site on a river has 77000 ha area. The mean annual precipitation is 950 mm. about 25% of precipitation reaches the basic outlet as stream flow. Estimate the mean flow rate Q at this site in m³/s.
- Explain the following methods for computing average rainfall over a basin.
 - Arithmetic average method
 - Thiesson's polygon method
 - Isohyetal method

Q3. Attempt any two of the following **2x10=20**

- Define the term "Infiltration". Describe the factors affecting for infiltration rates.
- A 25 cm diameter well penetrates 20m below water table. After 1 day pumping at a rate of 4600 litre/minutes. The water level in attest well at 110m is lowered by 0.7m and test well at 40 m away drawdown is 1.25 m. What is the transmissibility of aquifer?
- The infiltration capacities of an area at different intervals of time are indicated below. Find an equation for the infiltration capacity in the exponential form.

Time (hrs)	0	0.25	0.50	0.75	1.00	1.25	1.50	1.25	1.75	2.00
Infiltration capacity (cm/hr)	10.8	10.5	5.65	3.20	2.18	1.50	1.25	1.10	1.0	1.0

P.T.O

- Q4. Attempt any two of the following** **2X10=20**
- a) Derive an expression for the steady state discharge of well fully percolated into a confined aquifer.
 - b) A 25 cm diameter well penetrates 20m below water table. After 1 day pumping at a rate of 4600 litre/minutes. The water level in test well at 110m is lowered by 0.7m and test well at 40 m away drawdown is 1.25 m. What is the transmissibility of aquifer?
 - c) Briefly describe the following :
 - i) Method to measure velocity of runoff
 - ii) Compressibility of aquifer
 - iii) Hydrologic cycle
 - iv) Hyetograph
 - v) Evapo-transpiration
 - vi) Cavitations in open well

- Q5. Attempt any two of the following.** **2X10=20**
- a) Explain how the reservoir flood routing is estimated?
 - b) Explain
 - i) Linear channel
 - ii) Isochrones
 - iii) aquiclude and aquitard
 - iv) influence and effluent stream
 - v) ϕ -index and W- index
 - c) Determination the design flood discharge(allowing an increase of one third) for a bridge site with the following data: Catchment area = 2×10^5 hectares; Duration of storm =8hours ;Storm precipitation =3m; Time of concentration +2hours; Gauged discharge for a part flood with average maximum daily rainfall of 18cm was 3400 cumec.
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