Code No: **20CE7T02** **R20**

IV B. TECH I SEMESTER REGULAR EXAMINATIONS, NOVEMBER - 2023
WATER RESOURCE ENGINEERING
(CIVIL ENGINEERING)

Time: 3 hours Max. Marks: 70

Note : Answer **ONE** question from each unit **(5 × 14 = 70 Marks)**

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UNIT-I

1. a) Define hydrological cycle. Give a brief description of the different components of a hydrologic cycle. [7M]

   b) List the basic data required for hydrological studies and provide methods of hydrological data collection. [7M]

(OR)

2. a) List various methods available to measure the average depth of Rainfall and explain any one method in detail. [7M]

   b) How will you determine the optimum number of rain gauges for an area? [7M]

UNIT-II

3. a) Explain in detail various abstractions from rainfall? [7M]

   b) Explain the following terms in brief: (i) Infiltration capacity (ii) Infiltration rate (iii) Infiltration indices (w-index and ϕ-index) [7M]

(OR)

4. a) The total rainfall in a catchment area is 1000km^2 during a 6hr storm is 13cm, while the surface runoff during the storm is 1.5x10^8 m^3. Then estimate the φ index of the catchment. [7M]

   b) Explain factors affecting to the following terms: [7M]

   (i) Evaporation losses

   (ii) Transpiration losses

   (iii) Infiltration

UNIT-III

5. a) Explain the various factors which affect the run-off from basin. [7M]

   b) Define Stream gauging and What are the factors to be considered while selecting a Stream gauging site? [7M]

(OR)

6. a) The coordinates of the 4-hour unit hydrograph are given in the table to compute the ordinates of 8-hour UH. [7M]

Time	0	4	8	12	16	20	24	28	32	36	40	44
UH	0	20	50	150	120	90	70	50	30	20	10	0
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b) Define unit hydrograph? Write application, assumptions and limitations of the unit hydrograph. [7M]

UNIT-IV

7. a) Define flood and explain various causes of floods. [7M]

b) Describe flood frequency analysis in brief [7M]

(OR)

8. a) For a river, the estimated flood peaks for two return periods by the use of Gumbel's method is as follows: [7M]

Return period (years)	Peak flood (m^3/s)
100	435
50	395

What flood discharge in this river will have a return period of 1000 years?

b) Discuss about Muskingum method of reservoir routing? [7M]

UNIT-V

9. a) Derive an expression for discharge from a well which is fully penetrated in a confined aquifer. [7M]

b) Design a tube well for the following data: [7M]

(i) Yield required = 0.20 cumecs

(ii) Thickness of confined aquifer = 40 m.

(iii) Radius of circle of influence = 300 m.

(iv) Permeability coefficient = 80 m/day

(v) Drawdown = 6 m.

(OR)

10. a) Explain the significance of specific yield, porosity and specific retention in groundwater study? [7M]

b) Explain Yield of open well and explain Recuperation Test. [7M]

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