

CBCS SCHEME



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Fifth Semester B.E./B.Tech. Degree Examination, June/July 2025 Hydrology and Water Resources Engineering

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Discuss the various process involved in hydrologic cycle using Horton's engineering representation. (10 Marks)
- b. A catchment has six rain gauge stations. In a year, the annual rainfall recorded by the gauges are as follows:

Station	A	B	C	D	E	F
Rainfall (cm)	82.6	102.9	180.3	110.3	98.8	136.7

- i) Determine the standard error in estimation of mean rainfall in the existing set of rain gauges.
- ii) For 10% error in the estimation of the mean rainfall, calculate the optimum number of rain gauge stations in the catchment. (10 Marks)

OR

- 2 a. What is meant by evaporation losses? Discuss the factors affecting evaporation. (10 Marks)
- b. With neat sketch, illustrate the measurement of infiltration using double ring infiltrometer. (10 Marks)

Module-2

- 3 a. What is Runoff? List and explain factors affecting it. (10 Marks)
- b. Enumerate the rainfall-runoff correlation using linear regression equation. (10 Marks)

OR

- 4 a. Define hydrograph. With neat sketch explain the components of hydrograph. (10 Marks)
- b. The ordinate of a 3 hour unit hydrograph are given below:

Time in hr	0	3	6	9	12	15	18	21	24	27	30
Ordinates (m ³ /sec)	0	10	25	20	16	12	9	7	5	3	0

Find the ordinates of a 6 hour unit hydrograph for a basin. What is the peak value of discharge in this unit hydrograph? (10 Marks)

Module-3

- 5 a. Define Irrigation. Discuss in brief the benefits and ill-effects of Irrigation. (10 Marks)
- b. Illustrate the various method of surface Irrigation. (10 Marks)

OR

- 6 a. Derive the relationship between duty, delta and base period. (10 Marks)
- b. A reservoir with live storage of 400 million cubic meter is available to irrigate an area of 40,000 hectares with 2 fillings each year. The crop season is 125 days. What is the duty? (10 Marks)

Module-4

- 7 a. Discuss the factors to be considered while aligning the canal. (10 Marks)
b. Area of Irrigation = 3000 hectares
Area of Rabi crop = 50% of 3000 hectares
Area of sugar cane = 50% of 3000 hectares
Duty of Rabi crop = 2000 ha/cumec
Duty of the sugar cane = 2000 ha/cumec
Peak demand for rabi crop = 120% of average requirement
Conveyance loss in canal = 5%
Design the head discharge of the canal. (10 Marks)

OR

- 8 a. Define reservoir. Explain the types of reservoir based on the purpose. (10 Marks)
b. Discuss the procedure to find the capacity of the reservoir using mass in flow curve. (10 Marks)

Module-5

- 9 a. List and explain the causes of floods. (10 Marks)
b. Discuss the structural mitigation measures of flood management. (10 Marks)

OR

- 10 a. Define drought. Explain the causes of drought. (10 Marks)
b. Explain the following:
i) Rainwater harvesting technique
ii) Restoration and Rejuvenation of water bodies. (10 Marks)

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