

USN

Course Code 2 2 C V 6 3 2

Sixth Semester B.E. Degree Examinations, May/June 2026

HYDROLOGY AND IRRIGATION ENGINEERING

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module
 2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO: PI)</u>
<u>Module-1</u>			
1.	a. Explain hydrological cycle using engineering representation with any five definitions.	10	(2 :1: 1.2.1)
	b. List and explain any three practical applications of hydrology in detail. A catchment area of 600 km ² is divided by isohyets of 10 cm, 20 cm, 30 cm, 40 cm, and 50 cm. The areas between successive isohyets (10–20, 20–30, 30–40, and 40–50 cm) are 120 km ² , 200 km ² , 180 km ² , and 100 km ² respectively. Estimate the average rainfall over the catchment using the Isohyetal Method .	10	(2 :1: 1.2.1)
(OR)			
2.	a. Discuss all the metrological and physical factors affecting evaporation.	10	(2 :1: 1.2.1)
	b. Define transpiration and evapo-transpiration. Explain all the factors influencing evapo-transpiration.	10	(2 :1: 1.2.1)
<u>Module-2</u>			
3.	a. Define runoff. Explain all the climatic and physiographic factors affecting runoff.	10	(2 :2: 1.2.1)
	b. Define hydrograph. With a neat labelled diagram, explain all its components.	10	(2 :2: 1.2.1)
(OR)			
4.	a. With a neat labelled line diagram, explain base flow separation methods.	10	(2 :2: 1.2.1)
	b. Write a note on unit hydrograph with its applications and limitations.	10	(2 :2: 1.2.1)
<u>Module-3</u>			
5.	a. What is irrigation? Explain all the importance of irrigation.	10	(2 :3: 1.2.1)
	b. With a neat layout, explain sprinkler irrigation with advantages and disadvantages.	10	(2 :3: 1.2.1)
(OR)			
6.	a. Define duty and delta. Derive the relationship between duty, delta and base period with its notations and units. A crop requires the total depth of 90 cm of water for a base period of 115 days. Find the duty of water.	10	(3 :3: 1.2.1)

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

- b. Explain any two factors affecting duty of water. An irrigation canal has Grass Command Area (GCA) of 80,000 hectares, out of which 85 % is cultural irrigable. The intensity of irrigation for kharif season is 40 % & for rabi season is 50 %. Find the discharge required at the head of canal if the duty is 800 ha/cu for kharif season and 1700 ha/cu for rabi season. Also find delta for kharif and rabi seasons if base period are 120 days & 60 days respectively. **10 (3 :3: 1.2.1)**

Module-4

7. a. List all the classifications of canals and explain the following classifications based on:
(i) function of canal and (ii) discharge and its relative importance in a given network of canals **10 (2 :4: 1.2.1)**
- b. Define Gross Command Area. Discuss all the points considered for canal alignment. **10 (2 :4: 1.2.1)**

(OR)

8. a. Define reservoir. Explain all the investigations considered for reservoir site. **10 (2 :4: 1.2.1)**
- b. List all the factors affecting economical height of a dam. **10 (3 :4: 1.2.1)**
The following data shows the monthly inflow (in million cubic meters, Mm³) from **January to December** into a proposed reservoir: **10, 8, 6, 5, 4, 12, 18, 16, 14, 9, 7, and 11** respectively. Assuming a constant monthly demand of **10 Mm³**, determine the required storage capacity of the reservoir using the Mass Curve Method (determine by analytical and graphical method). Determine the maximum cumulative deficit & mention the required storage capacity clearly.

Module-5

9. a. List all the causes of floods and explain them in detail. **10 (2 :5: 1.2.1)**
- b. Write a note on flood alleviation measures (structural & non-structural). **10 (2 :5: 1.2.1)**
- (OR)**
10. a. What is drought? Explain all the reasons and Impacts of drought. **10 (2 :5: 1.2.1)**
- b. What is rain water harvesting? With neat diagram explain in detail how it works with uses and benefits. **10 (2 :5: 1.2.1)**

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