Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2023

Subject Code:2150602 Date:11-12-2023

Subject Name: Hydrology & Water Resources Engineering

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define Evapotranspiration, Runoff and Flood	**03**
	(b)	Discuss the factors affecting infiltration.	**04**
	(c)	What is hydrological cycle? Give a brief discussion of different components of hydrological cycle with neat sketch.	**07**
Q.2	**(a)**	Explain the terms with suitable example: Aquifuge, Aquiclude and Aquitard.	**03**
	(b)	Give the name of automatic rain gauges and explain any one in detail with figure.	**04**
	(c)	Explain the factors affecting hydrograph in detail.	**07**
		OR	
	(c)	A storm with a 16.0 cm precipitation produced a direct runoff of 8.9 cm. The time distribution of the storm is as follow. Estimate the w-index and Ɵ-index.	**07**

Time in hour	1	2	3	4	5	6	7	8
Incremental Rainfall in cm	0.7	1.36	2.30	3.48	2.8	2.6	2.0	0.76

Q.3	**(a)**	What is spillway? Explain function of spillway	**03**
	(b)	Define the term ‘Drought’. Briefly explain the types of drought	**04**
	(c)	Write down the different methods available for Flood estimation and explain any two methods.	**07**
		OR	
Q.3	**(a)**	Explain Gravity Dam and Earth Dam	**03**
	(b)	What is Darcy’s Law? How will you measure co-efficient of permeability of a soil?	**04**
	(c)	Discuss the various methods of determining the average depth of rainfall over a catchment.	**07**
Q.4	**(a)**	Define the terms: (1) Infiltration index (2) Specific yield	**03**
	(b)	What is the difference between hyetograph and hydrograph?	**04**
	(c)	Define the term ‘Evaporation’. Explain the factors affecting evaporation	**07**
		OR	
Q.4	**(a)**	Explain the pumping test to estimate the safe yield from an open well.	**03**
	(b)	Describe in brief Reservoir sedimentation	**04**
	(c)	Discuss with neat sketch, the various zones of reservoir.	**07**
Q.5	**(a)**	Explain various causes of flood.	**03**
	(b)	List of the structural and non – structural approaches of controlling damage due to floods. Explain structural flood control measures.	**04**

	(c)	What is Water harvesting? Explain various methods water harvesting	**07**

OR

Q.5	**(a)**	Explain the rational method to estimate peak discharge.	**03**
	(b)	Describe in brief Flood damage analysis.	**04**
	(c)	Draw a neat sketch of 'Hydroelectric power plant'. Explain the each component briefly.	**07**

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