Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– VI (NEW) EXAMINATION – WINTER 2021

Subject Code:3160610 Date:24/11/2021

Subject Name:Water Resources Engineering and Hydrology

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)**	What is Hydrologic Cycle? Write its applications.	**03**
	(b)	Write the assumptions and Limitations of unit hydrograph theory.	**04**
	(c)	Discuss the engineering measures for flood control.	**07**
Q.2	**(a)**	What is Infiltration? Discuss the factors affecting the infiltration rate.	**03**
	(b)	Explain the use of Float type rain gauge.	**04**
	(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 follows. Estimate the ϕ-index of the storm.	**07**

Time(hr.)	1	2	3	4	5	6	7	8
Incremental rainfall (cm)	0.7	1.36	2.30	3.48	2.8	2.6	2.0	0.76

OR

	(c)	The ordinates of 4-hour unit hydrograph are given below.	**07**

Time in Hours	0	4	8	12	16	20	24	28	32	36	40	44
Ordinates m^3/sec	0	20	50	150	120	90	70	50	30	20	10	0

Find the ordinates of 8-hour unit hydrograph for the same basin.

Q.3	**(a)**	Define the following terms 1) Percolation 2) Base flow 3) W-index	**03**
	(b)	Discuss with neat sketch, the various storage zones of reservoir.	**04**
	(c)	Briefly discuss the components of a hydropower project.	**07**

OR

Q.3	**(a)**	Define the following terms 1) Density currents. 2) Trap efficiency. 3) Useful life of reservoir.	**03**
	(b)	Explain Darcy's law and give its limitations	**04**
	(c)	Discuss the various methods of controlling sedimentation of reservoirs.	**07**
Q.4	**(a)**	Define the following terms 1) Aquifer 2) Aquiclude 3) Aquifuge	**03**
	(b)	Differentiate between Runoff River plant and storage plant.	**04**
	(c)	Explain how the elevation area curve and elevation capacity curve are prepared? What is the use of this curve in reservoir planning?	**07**

OR

Q.4	**(a)**	Explain Design flood and Time of Concentration	**03**
	(b)	Differentiate between Confined aquifer and Unconfined aquifer.	**04**
	(c)	Explain Recuperation test to estimate the safe yield of an open well.	**07**

Q.5	**(a)**	Discuss channel routing in detail.	**03**
	(b)	Discuss water resources planning and its objectives.	**04**
	(c)	Discuss the measures to be adopted for water conservation and augmentation in water scarce regions.	**07**

OR

Q.5	**(a)**	Discuss the factors affecting runoff in a catchment area	**03**
	(b)	Explain various methods of estimating floods.	**04**
	(c)	What is S-hydrograph? How it is constructed? What ae its uses?	**07**

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