Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3160610 Date:02-12-2023

Subject Name:Water Resources Engineering and Hydrology

Time:02:30 PM TO 05:00 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 the following terms. (1) Hydrology,(2) Precipitation,(3) Flood	**03**
	(b)	Give difference between gravity dam and earthen dam.	**04**
	(c)	Explain the hydrological cycle with its applications and also draw the neat sketch.	**07**
Q.2	**(a)**	Explain the factors affecting Evaporation.	**03**
	(b)	Define drought and explain any two types of drought.	**04**
	(c)	For a storm of 2-hrs durations, the rainfall intensity is as follows. If the ω-index is 3 cm/hr. Find out the surface runoff and W-index.	**07**

Time period (min)	20	20	20	20	20	20
Rainfall intensity (cm/hr)	2.6	2.5	10.2	7.8	5.2	2.0

OR

	(c)	In a certain river basin, there are five rain gauges stations, with their normal precipitations amounting to 810,420,540,380 and 1000 mm respectively. Determine the optimum numbers of rain gauge in the catchment required. Take, error in the man value of rainfall is 12%.	**07**
Q.3	**(a)**	Explain the assumptions to be taken for Unit Hydrograph Theory.	**03**
	(b)	Give the difference between confined and unconfined aquifer with neat sketches.	**04**
	(c)	The ordinates of 3-hr unit hydrograph are as per given table. Compute the ordinate of 6-hours unit hydrograph.	**07**

Time (hr)	0	3	6	9	12	15	18	21	24	27	30	33
Unit hydrograph (cumec)	0	20	50	150	120	90	70	50	30	20	10	0

OR

Q.3	**(a)**	Define the following terms. (1) Ground water, (2) Dam, (3) Reservoir.	**03**
	(b)	Write the short note on S-hydrograph.	**04**
	(c)	Water was pumped out from a well in a confined aquifer 10 m thick, having a hydraulic conductivity of 1.5 m/day. The drawdown observed in the two adjoining wells at 10m and 50 m from the pumping well was 3.2 m and 0.08 m respectively. Find the constant rate of pumping.	**07**

Q.4	**(a)**	Write short note on Reservoir sedimentation.	**03**
	(b)	Explain different forms of precipitation in brief.	**04**
	(c)	Explain with neat sketch storage zone of reservoir.	**07**
		OR	
Q.4	**(a)**	Give difference between hyetograph and hydrograph.	**03**
	(b)	Classify the hydro power plants. Explain any one in detail.	**04**
	(c)	Discuss the environment impact of multipurpose water resources projects.	**07**
Q.5	**(a)**	Write short note on Flood proofing and Flood forecasting.	**03**
	(b)	Explain flood frequency analysis.	**04**
	(c)	Explain the Darcy's law. Discuss its limitations and validity.	**07**
		OR	
Q.5	**(a)**	Explain flood routing through reservoir.	**03**
	(b)	Write short note on "Water harvesting system".	**04**
	(c)	Explain theoretical probability distribution Gumbel's method.	**07**

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