GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–V (NEW) EXAMINATION – WINTER 2020

Subject Code:2150602   **Date:01/02/2021**
Subject Name:Hydrology & Water Resources Engineering
Time:10:30 AM TO 12:30 PM   **Total Marks: 56**

Instructions:
1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

                                                                                   MARKS

Q.1	**(a)**	Define : Hydrology, Flood routing, Penstocks	**03**
	(b)	List out the various methods used to calculate the average depth of rainfall over a catchment and explain any one with neat sketch.	**04**
	(c)	What is hydrograph? Draw a single peaked hydrograph and explain its components. What are the factors affecting the shape of the hydrograph.	**07**
Q.2	**(a)**	Describe the various types of dams based on the function served.	**03**
	(b)	Define the term 'Drought'. Briefly explain the types of drought.	**04**
	(c)	The ordinates of 3 hrs Unit hydrograph are given below :	**07**

Time in Hrs.	0	3	6	9	12	15	16	21	24	27	30
Ordinates (cumecs)	0	10	25	20	16	12	9	7	5	3	0

Find the ordinates of a 6 hrs UH for the same basin analytically. Also, sketch 6 hr – Unit hydrograph. What is the peak value of discharge in 6 hr – Unit hydrograph?

Q.3	**(a)**	Briefly explain the forms of precipitation.	**03**
	(b)	The average rainfall over a basin of area 50 ha during a storm was as follows :	**04**

Time (hr)	0	1	2	3	4	5	6	7
Rainfall (mm)	0	6	11	34	28	12	6	0

If the volume of runoff from this storm was measured as 25000 m^3, determine Φ – index for the storm.

	(c)	Explain with neat sketch storage zones of reservoir.	**07**
Q.4	**(a)**	Define : Unit Hydrograph, Darcy's law, Flood	**03**
	(b)	What is a spillway? List out the types of spillway and explain any one briefly.	**04**
	(c)	Describe the process of the Hydrological cycle with a neat sketch.	**07**
Q.5	**(a)**	Explain causes of flood.	**03**
	(b)	Write a short note: Methods for Separation of Base flow.	**04**
	(c)	Draw a neat sketch of 'Hydroelectric power plant'. Explain the each component briefly.	**07**

Q.6 **(a)** Define: Time of concentration, Groundwater, Runoff. **03**

(b) Explain the pumping test to estimate the safe yield from an open well. **04**

(c) List of the structural and non – structural approaches of controlling damage due to floods. Explain structural flood control measures. **07**

Q.7 **(a)** Define: Evapo- transpiration, Precipitation, Infiltration **03**

(b) Write down the different methods available for Flood estimation and explain any two methods. **04**

(c) Explain Roof top rain water harvesting with neat sketch. **07**

Q.8 **(a)** Enlist the different types of aquifers. Describe any one aquifer with neat sketch. **03**

(b) What is the difference between hyetograph and hydrograph? **04**

(c) Define the term 'Evaporation'. Explain the factors affecting evaporation. **07**

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