GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER– III • EXAMINATION – SUMMER 2015

Subject Code: X30601   **Date:29/05/2015**

Subject Name: Hydrology and Water Resources Engineering

Time: 02.30pm-05.00pm   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	What is hydrology? Explain the hydrology cycle with neat sketch.	**07**
	(b)	Define the following terms:	**07**

     (i) Precipitation (ii) Evaporation (iii) Infiltration (iv) Hydrograph
     (v) Base flow (vi) Infiltration rate (vii) Hyetograph

Q.2	**(a)**	Explain "Theissen Polygon method for determining the average rainfall of a given catchment".	**07**
	(b)	Determine the optimum number of rain gauges in a catchment area from the following data:	**07**

- Number of existing rain gauges = 8
- Mean annual rainfall at the gauges = 1000, 950, 900, 850, 800, 700, 650, 600 respectively
- Permissible error = 6%

OR

	(b)	Explain the following: (i) Convective precipitation (ii) frontal precipitation	**07**

Q.3	**(a)**	Discuss the factors affecting infiltration capacity.	**07**
	(b)	What is evapotranspiration? Explain the factors affecting it.	**07**

OR

Q.3	**(a)**	What is flood? What are the causes of floods? Discuss the various methods of flood control.	**07**
	(b)	For a storm of 2-hr durations, the rainfall rate are as follows:	**07**

Time period (minutes)	20	20	20	20	20	20
Rainfall rate (cm/hr)	2.5	2.5	10.0	7.0	5.1	1.5

If Ø – index is 3 cm/hr, estimate the surface runoff. Also determinate W-index.

Q.4	**(a)**	Describe various causes of drought.	**07**
	(b)	What are the various components of hydro-electric power project? Discuss them.	**07**

OR

Q.4	**(a)**	Discuss the types of aquifers with neat sketches.	**07**

(b) The ordinates of 4 hr unit hydrograph are given in the table. Compute the ordinate of 8 hr unit hydrograph. **07**

Time (hour)	0	4	8	12	16	20	24	28	32	36	40	44
Unit hydrograph (cumec)	0	20	50	150	120	90	70	50	30	20	10	0

Q.5 **(a)** For a drainage basin of 600 km^2, isohyets drawn for a storm gave the following data: **07**

Isohyets (cm)	40	35	30	25	20	15	10
Catchment area enclosed (km^2)	-	35	90	350	370	430	900

(b) Discuss the causes of sedimentation in reservoir. How will you control them? **07**

OR

Q.5 **(a)** Describe various measures for water conservation. **07**
(b) Explain with neat sketch the Symon's rain gauge. **07**

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