Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC- SEMESTER–III - EXAMINATION – SUMMER 2017

Subject Code: X30601 **Date:25/05/2017**

Subject Name: Hydrology And Water Resources Engineering

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.**

Q.1 **(a)** Define: Hydrological Cycle. Describe the different components of hydrological cycle with neat sketch. **07**

(b) Enlist different types of rain gauges. Explain any two Recording type of rain gauges with neat sketches. **07**

Q.2 **(a)** Explain different types of precipitations in brief. **07**

(b) Define the term "Run-off". Explain factors affecting for run-off. **07**

OR

(b) What is meant by Evapotranspiration? Enlist different methods of estimation of evaporation and explain any one method in detail. **07**

Q.3 **(a)** Explain Ø-index and W-index with the procedure to determine the same. **07**

(b) Determine the optimum number of rain gauges for a basin with the following data: **07**

Number of existing gauges = 7,

Allowable permissible error = 8%,

The average rainfall the existing gauges = 110,90,46,75,135,87,65 cm.

OR

Q.3 **(a)** What is S-curve hydrograph? How is it constructed and what is it used for? **07**

(b) Explain the procedure of separating base flow in a hydrograph. **07**

Q.4 **(a)** Define the terms: Recurrence interval, Hyetograph, Hydrograph, Wedge storage, Prism storage, Infiltration, Deep Percolation. **07**

(b) A 3-hr. storm produced a flood hydrograph as under. **07**

Time(hrs)	0	3	6	9	12	15	18	21	24	27	30
Discharge (cumecs)	4	9	12	18	20	16	20	10	8	6	4

Assuming a constant base flow of 4 cumecs, determine the ordinates of unit hydrograph and draw the UH in graph paper. The catchment area is 50 km^2.

OR

Q.4 **(a)** Define: Simulation. Discuss the application of simulation modeling techniques in hydrology and water resources engineering. **07**

(b) For a river, the estimated flood peaks for two return periods by the use of Gumbel's methods are as follow. Find out flood discharge in this stream for a return period of 500 years. **07**

Return Period (years)	Peak flood (m^3/s)
100	450
50	370

Q.5 **(a)** State Darcy's Law. How will you measure the co-efficient of permeability of soil? **07**

(b) Explain "Flood Routing'. Explain Modified Pul's method of reservoir routing. **07**

OR

Q.5 **(a)** Explain different types of aquifers in brief with neat sketch. **07**

(b) Differentiate between: (i) Flood walls and Flood ways and (ii) Flood forecasting and Flood proofing. **07**

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