Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

P.D.D.C. Sem- III Examination December 2010

Subject code: X30601

Subject Name: Hydrology & Water Resources Engineering

Date: 11 /12 /2010 **Time: 10.30 am – 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.**

Q.1 **(a)** Describe various methods of computing average rainfall over a basin. **07**

(b) What is meant by stream gauging? Describe the velocity area method used for stream gauging. **07**

Q.2 **(a)** Explain : Evaporation, Infiltration, Interception, Transpiration, Percolation **07**

(b) Estimate the equivalent uniform depths of 2-day rainfall over the basin and plot D-A-D curve for the following data. **07**

Isohyets (mm)	35-40	30-35	25-30	20-25	15-20	10-15
Area between Isohyets (sqkm)	35	56	78	120	65	18

OR

(b) The following are the rates of rainfall for successive 15 minutes period of a 90 minute storm : 2.8, 8, 6.5, 1.8, 3.5, 6 cm/hr. Taking the value of Ø-index as 3.0 cm/hr, find out the net runoff in cm., total rainfall and the value of W-index. **07**

Q.3 **(a)** What do you understand by Unit hydrograph? How is it derived? What are the uses of unit hydrograph? **07**

(b) Given below are the observed flows from a storm of 6-hr duration on a stream in m^3/s at 6-hr intervals. Basin area is 320 sqkm. Assuming constant base flow of 20 cumecs. **07**

20,110,250,200,160,120,90,75,55,35,20

Derive and plot a 6-hr unit hydrograph.

OR

Q.3 **(a)** Describe various methods of estimating evaporation from water bodies. **07**

(b) Describe how infiltration capacity rate can be measured using Double ring infiltrometer. **07**

Q.4 **(a)** What is Run-off ? What are the factors that affect the run-off from a Basin. **07**

(b) What is S-curve hydrograph? How is it constructed and what is it used for? **07**

OR

Q.4 **(a)** Enumerate the various methods used for estimating design flood discharge from a basin, and discuss any one of them in details. **07**

(b) Define flood routing. What are the uses of flood routing? **07**

Q.5 **(a)** Explain any one simulation model. **07**

(b) Explain: Specific yield, Storage co-efficient, Field capacity, Perched water table. **07**

OR

Q.5 **(a)** Explain Darcy's law for determining groundwater velocity. **07**

(b) Explain confined and unconfined aquifers with neat sketch. **07**

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