

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: X 30601**Date: 26/12/2012****Subject Name: Hydrology and Water Resources Engineering****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) Define and explain Hydrological Cycle with neat sketch. **07**
 (b) Explain “Thiessen Polygon method for determining average rainfall of a given catchment/” **07**

- Q.2** (a) Discuss the factors affecting run-off from catchment area. **07**
 (b) What is Unit Hydrograph? What are its applications? **07**

OR

- (b) Define: 1) Time of Concentration(tc) **07**
 2) Recession time (tr)
 3) Basing Lag. (tp)

- Q.3** (a) Define and explain (1) ϕ –Index (2) W-Index **07**
 (b) Discuss the factors affecting infiltration capacity. **07**

OR

- Q.3** (a) Explain Gumbel’s method in detail **07**
 (b) What is Evapotranspiration? Discuss factors affecting it. **07**

OR

- Q.4** (a) For a storm of 2-hour durations, the rainfall rates are as follows: If ϕ -Index is 3cm/hr, estimate the surface runoff. Also determine W-Index. **07**

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|-------------------------|-----|-----|------|-----|-----|-----|
| Time period (minutes) | 20 | 20 | 20 | 20 | 20 | 20 |
| Rainfall rate (cm / hr) | 2.6 | 2.5 | 10.2 | 7.8 | 5.2 | 1.3 |

- (b) How the useful life of a reservoir can be determined? **07**

OR

- Q.4** (a) What are the components of hydro electrical power project? Discuss them **07**

- Q.4** (b) Describe various causes of draught. **07**

OR

- Q.5** (a) Discuss the causes of sedimentation in reservoir. How will you control them? **07**

- (b) Define: 1) Surcharge storage **07**
 2) Bank storage
 3) Trap Efficiency

OR

- Q.5** (a) Explain with neat sketch storage zones of a reservoir. **07**
 (b) What are the environmental issues in water resources project? **07**
