

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC-Semester –III (May-2012) Examination

Subject code: X30601

Subject Name: Hydrology and water resources Engineering

Date: 14/05/2012

Time: 02.30 pm – 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 and explain Hydrological Cycle with neat sketch. **07**
(b) What is unit hydrograph? What are its applications? **07**

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| Q.2 | (a) Explain ‘Thiessen Polygon’ Method for determining average Rainfall of a given catchment. | 07 |
| | (b) Define : 1) Time of concentration (t_c)
2) Recession time (t_r)
3) Basin Lag. (t_p) | 07 |

OR

- (b)** Discuss the factors affecting run-off from catmint area. **07**

- Q.3** (a) Explain the Gumbel's method. **07**
(b) Write short note on rain water harvesting. **07**

OR

- Q.3** (a) Discuss the causes of sedimentation in reservoir. How will you control them? **07**
(b) Enumerate the components of hydroelectric power project? Discuss them. **07**

- Q.4 (a)** Define: 1) Surcharge storage **07**
 2) Bank storage
 3) Trap Efficiency
- (b)** How will you control the flood? Explain in detail. **07**

OR

- Q.4** (a) A flood of certain magnitude has a return period of 50 years **07**
 a) What is its probability of exceedance?
 b) What is the probability that this flood may occur at least once in the next 25 years?
- (b) Define Darcy's law. What are its limitations? **07**

- Q.5** (a) How the useful life of a reservoir can be determined? **07**
 (b) For a storm of 3-hour durations, the rain fall rates are as follows **07**

Time period (minute)	30	30	30	30	30	30
Rainfall rate (cm/hr)	3.5	3.0	12.0	8.5	6.0	1.5

If ϕ -Index is 5cm/hr, estimate the surface run-off. Also determine W-Index.

OR

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|------------|------------|-----------------------------------|-----------|
| Q.5 | (a) | Discuss the infiltration indices. | 07 |
| | (b) | Define: 1)Unconfined aquifer | 07 |
| | | 2) Confined aquifer | |
| | | 3) Permeability | |
