

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – WINTER • 2014****Subject Code: 150602****Date: 28-11-2014****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)** Discuss various causes of drought. **07**
(b) Discuss water resources planning and its objectives. **07**

- Q.2 (a)** Explain the methods of estimating flood. **07**
(b) Describe the flood routing with neat sketch. **07**

OR

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

- Q.3 (a)** Describe the process of the hydrological cycle with a neat sketch. **07**
(b) In a watershed, the average annual precipitation for four sub-basins was recorded as follows: 100.84, 112.27, 84.84 & 73.406 cm. the areas of the sub-basins were : 93264.3, 71243.5, 108808.2 & 168393.8 ha., calculate the average precipitation of the total watershed using the Thiessen method. **07**

OR

- Q.3 (a)** Discuss the various methods used to measure rate of evaporation from a reservoir. **07**
(b) The excess rainfall (direct runoff) produced from a 10.0 cm rainfall of a storm is 6.0 cm. the rainfall at each hour of the storm recorded by a rain gauge is as under. Calculate the infiltration index of the storm. **07**

Time (h)	1	2	3	4	5	6	7	8
Incremental rainfall (cm)	0.1	1.0	1.4	2.6	2.0	1.5	1.0	0.4

- Q.4 (a)** What is drainage basin? Discuss various characteristics of drainage basin. **07**
(b) The ordinates of a 4 h UH of a basin of area 300 km² measured at 1 h intervals are 6, 36, 66, 91, 106, 93, 79, 68, 58, 49, 41, 34, 27, 23, 17, 13, 9, 6, 3 and 1.5 m³/s respectively. Obtain the ordinates of a 3 h UH for the basin using the S-curve technique. **07**

OR

- Q.4 (a)** Discuss types of aquifers with neat sketches. **07**
(b) The direct runoff hydrograph resulting from a 5.0 cm effective rainfall of 6 h duration is given below. Determine the area of the catchment and the ordinates of the 6 h Unit hydrograph. **07**

Time (h)	0	6	12	18	24	30	36	42	48	54	60	66	72
Direct runoff (m ³ /s)	0	25	175	320	360	310	230	165	105	60	30	10	0

- Q.5 (a)** Describe briefly the various types of reservoirs and also differentiate between single and multipurpose reservoirs. **07**
(b) Discuss various classifications of hydropower plants. **07**

OR

- Q.5 (a)** Explain the terms : density current, Normal pool level, Dead storage, reservoir yield. **07**
(b) Write short notes on : Surge tank, Penstocks **07**
