

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**M. E. - SEMESTER – I • EXAMINATION – WINTER • 2014**

**Subject code: 711202****Date: 02-12-2014****Subject Name: Hydrology and Watershed Management****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 mark.

- Q.1 (a)** Define depth area duration (DAD) curve. Explain step by step procedure for deriving DAD curve. **07**
- (b)** What do you understand by water balance of a catchment? Explain the various methods of estimating runoff from a catchment. **07**

- Q.2 (a)** Differentiate between effluent and influent stream, Discuss the basin characteristics affecting runoff. **07**
- (b)** Define stream gauging. Explain in brief the method of stream gauging by Area velocity method. **07**

**OR**

- (b)** Differentiate between instantaneous unit hydrograph and synthetic unit hydrograph. What are the applications of Unit hydrograph? **07**

- Q.3 (a)** Define flow rating curve. Explain its uses and what would be the sources of error in getting the discharge from the rating curve. **07**
- (b)** Define design flood. Determine the design flood discharge allowing with an increase of one -third for a bridge site with the following data. Gauge discharge for the past flood with average maximum daily rainfall of 16 cm was 3200 cumec.
- i) Catchment area = 200000 ha.
  - ii) Duration of storm = 6 hrs
  - iii) Storm precipitation = 3 cm
  - iv) Time of concentration = 2 hrs

**OR**

- Q.3 (a)** Explain flood routing by ISD curve method. **07**
- (b)** For the group data of the annual floods observed in a river, find out the coefficient of skewness. **07**

Class interval ( 1000 cumec)	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18
Frequency	0	15	25	16	16	5	0	1	1

- Q.4 (a)** Define partial duration series. Explain stochastic modeling by partial duration series. **07**
- (b)** Explain the significance of weather station in watershed management **07**

**OR**

- Q.4 (a)** Discuss the objectives of watershed management. Explain how afforestation contributes toward watershed management **07**
- (b)** Explain Conceptual model with a neat flow chart. **07**

- Q.5 (a)** Explain rainfall runoff model based on retention concept. **07**
- (b)** Discuss the watershed characteristic and its importance in watershed management. **07**

**OR**

- Q.5** (a) Explain various types of precipitation. **07**  
(b) Explain the need of hydrological modeling in the analysis of hydro geological characteristics. **07**

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