Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 711202N **Date: 26-12-2013**

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 marks.**

Q.1	**(a)**	What are the factors affecting infiltration? Explain any one method of finding infiltration capacity of soil surface.	**07**
	(b)	Discuss in brief characteristics of watershed.	**07**
Q.2	**(a)**	Explain the method for estimating the missing rainfall data at a station in a basin.	**07**
	(b)	Explain terrace method for controlling soil erosion.	**07**
		OR	
	(b)	Name the equipment used for measuring velocity in a stream. The following data were obtained by stream gauging of a river: Main gauge staff reading(m) 13 13 Auxiliary gauge staff reading(m) 12 11.05 Discharge(cumecs) 10 16 What should be the discharge when the main gauge reads 13 m and the auxiliary gauge reads 11.5 m?	**07**
Q.3	**(a)**	Discuss the various factors affecting run off from a basin.	**07**
	(b)	Differentiate the characteristics of stochastic and deterministic components of time series data.	**07**
		OR	
Q.3	**(a)**	What are the objectives of watershed management? Explain.	**07**
	(b)	Discuss the significance and characteristics of stochastic component in time series.	**07**
Q.4	**(a)**	State the different methods used for computation of peak runoff. Explain rational method for determining peak run off rate along with its limitations.	**07**
	(b)	Discuss dynamic models for hydrological analysis of catchment.	**07**
		OR	
Q.4	**(a)**	Explain Synder's method for synthetic unit hydrograph.	**07**
	(b)	Derive Clark's model of instantaneous unit hydrograph (IUH).	**07**
Q.5	**(a)**	Explain stage discharge rating curve.	**07**
	(b)	What are the different ways of harvesting rainwater? Explain any two.	**07**
		OR	
Q.5	**(a)**	Differentiate modified Pul's method and Goodrich's method of reservoir routing.	**07**
	(b)	Explain how watershed management helps in reducing peak floods.	**07**

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