Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – SUMMER • 2014

Subject code: 711202N **Date: 17-06-2014**

Subject Name: Hydrology and Watershed Management

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 watershed, its formation and watershed hydrology.	**07**
	(b)	What is watershed management and why it is considered as a basic scientific unit for water resources planning and management?	**07**
Q.2	**(a)**	Describe spatial and temporal variability in hydrologic parameters with suitable exemplary data.	**07**
	(b)	Define: Sub-watershed, Sink, Stream network, Pour point and HRU.	**07**
		OR	
	(b)	Briefly describe the existing approaches for rainfall-runoff relationships.	**07**
Q.3	**(a)**	Explain NRCS curve number (CN) method of separating precipitation into abstractions and runoff, giving details of computation of all the factors used in this method.	**07**
	(b)	What is model calibration and validation? Write calibration parameters for any one model you have worked on.	**07**
		OR	
Q.3	**(a)**	Explain MUSLE equation and its theory for soil transportation.	**07**
	(b)	Determine mean, median, mode, standard deviation, coefficient of variance and skew-ness for the following rainfall data (in mm): 721, 543, 319, 763, 410, 608, 522, 488, 578, 998, 436, 594, 433, 517 and 674.	**07**
Q.4	**(a)**	Compare lumped models to physically based models in detail with at least two examples in each category.	**07**
	(b)	Write a brief overview of HEC-HMS model. Also give a flow chart explaining various hydrological processes simulated by it.	**07**
		OR	
Q.4	**(a)**	Distinguish stochastic and deterministic hydrologic models in detail with at least two examples in each category.	**07**
	(b)	Write a brief overview of ARS-SWAT model. Also give a flow chart explaining various hydrological processes simulated by it.	**07**
Q.5	**(a)**	Explain California method for flood frequency analysis.	**07**
	(b)	Explain Pulõs method of routing a hydrograph through a reservoir.	**07**
		OR	
Q.5	**(a)**	Explain channel routing by Muskingum method.	**07**
	(b)	Explain Synderõs method for Synthetic unit hydrograph.	**07**

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