GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. IST Semester–Remedial Examination – July- 2011
Subject code: 711202N
Subject Name: Hydrology & Watershed Management
Date:08/07/2011   **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)**	Define watershed and watershed hydrology in detail.	**07**
	(b)	Define CN method for runoff with its parameters.	**07**
Q.2	**(a)**	Explain calibration and validation of a simulation model.	**07**
	(b)	Write a brief overview of HEC-HMS model. Also give a flow chart explaining various hydrological processes simulated by it.	**07**

OR

	(b)	Write a brief overview of ARS-SWAT model. Also give a flow chart explaining various hydrological processes simulated by it.	**07**
Q.3	**(a)**	Differentiate between lumped and physically distributed models.	**07**
	(b)	Write applications of remote sensing in watershed management.	**07**

OR

Q.3	**(a)**	Explain the effect of size and shape of basin on runoff.	**07**
	(b)	Write applications of GIS in hydrology and watershed management.	**07**
Q.4	**(a)**	Describe spatial variability in hydrology with suitable exemplary data.	**07**
	(b)	The following records of maximum flood are available. Estimate the magnitude of flood having frequency equal to 80 years by Gumbel's method. Record collected from 1981 to 1995 is: 3020, 4350, 6200, 3400, 2800, 3800, 3350, 6700, 5340, 3700, 4100, 9100, 4190, 3680, and 5300 cumecs.	**07**

OR

Q.4	**(a)**	Write various possible treatments, their role and impact on watershed.	**07**
	(b)	A watershed is characterized as follows: drainage area A of 320 acres; time of concentration t_c of less than the 3-hour rainfall duration; rational method runoff coefficient C of 0.40; CN of 74; rainfall erosivity factor R of 200; soil erodibility factor K of 0.38; topographic factor LS of 0.75; cover management factor C of 0.40; and erosion control practice factor P of 1.0. Determine the sediment yield to result from a storm with 2.5 inches of rain falling in 3.0 hours with an approximately uniform temporal and spatial variation.	**07**
Q.5	**(a)**	Explain California method for flood frequency analysis.	**07**
	(b)	Explain Synder's method for Synthetic unit hydrograph.	**07**

OR

Q.5	**(a)**	Explain channel routing by Muskingum method.	**07**
	(b)	Define: Sub-watershed, Sink, Stream network, Pour point and HRU.	**07**

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