

GUJARAT TECHNOLOGICAL UNIVERSITY**M.E Sem-I Remedial Examination January/ February 2011****Subject code: 711202 Subject Name: Hydrology & Watershed Management****Date: 01 /02 /2011****Time: 02.30 pm – 05.00 pm****Instructions:****Total Marks: 60**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain various components of water budget equation through hydrologic cycle. **06**
 (b) Define watershed and watershed hydrology. **06**
- Q.2** (a) Differentiate between lumped models and physically based models. **06**
 (b) Write a brief overview of ARS-SWAT model. Also give a flow chart explaining various hydrological processes simulated by it. **06**

OR

- (b) Write a brief overview of HEC-HMS model. Also give a flow chart explaining various hydrological processes simulated by it. **06**
- Q.3** (a) Describe spatial variability in hydrology with suitable exemplary data. **06**
 (b) Write applications of remote sensing in watershed management. **06**

OR

- Q.3** (a) What is model calibration and validation? **06**
 (b) Write applications of GIS in hydrology and watershed management. **06**
- Q.4** (a) Differentiate between hydraulic routing and hydrologic routing. **06**
 (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. **06**

OR

- Q.4** (a) Explain channel routing by Muskingum method. **06**
 (b) Explain California method for flood frequency analysis. **06**
- Q.5** (a) Explain Synder's method for Synthetic unit hydrograph. **06**
 (b) Write various possible treatments, their role and impact on watershed. **06**

OR

- Q.5** (a) Explain the effect of size and shape of basin on runoff. **06**
 (b) Annual rainfall and runoff data for the Damodar River at Rhondia for 17 years are given below. Determine the linear regression line between rainfall and runoff and correlation coefficient. **06**

Year	Rainfall, mm	Runoff, mm
1934	1088	274
1935	1113	320
1936	1512	543
1937	1343	437
1938	1103	352
1939	1490	617
1940	1100	328
1941	1433	582
1942	1475	763
1943	1380	558
1944	1178	492
1945	1223	478
1946	1440	783
1947	1165	551
1948	1271	565
1949	1443	720
1950	1340	730
