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ET-532(A)

01304

B.Tech. Civil (Water Resources Engineering)

Term-End Examination
June, 2011

ET-532(A) : HYDROLOGY

Time : 3 hours *Maximum Marks : 70*

Note : *Question No. 1 is **compulsory**, which carries **10** marks. Attempt **any four** out of the remaining **six** questions. Use of calculator is allowed.*

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1. State the following sentence true or false. **10**

(a) Evaporation in Pan is less than that of lake.

(b) A plot between rainfall intensity versus time is called as hydrograph.

(c) A stilling well is required when the stage measurement is made by float gauge recorder.

(d) A unit hydrograph has one unit of peak discharge.

(e) In the Muskingum method of channel routing the weighing factor x can have a value between -0.5 to 0.5.

2. (a) Draw a neat sketch showing dimensions of ISI modified Class A Pan. 5

(b) A Tank with surface area of 100 ha had the following average parameters during a week : 10

Water temperature = 20° C

Relative humidity = 40%

Wind velocity at 1 m above ground level = 16 km/hr

Estimate the average daily evaporation from the Tank and volume of water evaporated during that one week. (Assume saturated vapour pressure at 20°C = 17.54 mm of Hg.)

3. (a) Explain with a neat sketch the functioning of float type gauge recorder and stilling well installation. 6

(b) Define unit hydrograph. What are the assumptions made in the theory of unit hydrograph ? 5

(c) Give defination of the following terms : 4

(i) Direct run off

(ii) Effective rainfall

(iii) Base flow

(iv) Basin Lag

4. (a) Define the terms used for measure of Central Tendency : Mid Range, Mode, Median and Mean. 5

(b) The annual mean rainfall (cms) at Bhopal for the year 1980 - 81 to 2005 - 06 are : 10

82.87, 67.95, 46.46, 100.79, 125.28, 60.01, 96.73, 95.75, 76.62, 114.70, 92.76, 144.35, 59.83, 95.38, 137.76, 121.38, 148.87, 121.00, 47.99, 92.34, 90.26, 77.70, 76.11, 95.09, 95.47, 78.62.

Find mid range, median and mean rainfall for the above data.

5. (a) Differentiate between inflow and outflow hydrographs used in flood routing. 5

(b) Derive the formula used in Muskingum method of channel routing. 10

6. Discuss the factors affecting flood hydrograph. Explain method of base flow separation from a flood hydrograph. 8, 7

7. (a) What are the basic assumptions made in derivation of steady flow equation for aquifers. 5

(b) Derive the Dupuit equation for study flow in an unconfined aquifer. 10