

B.Tech. Civil (Construction Management)
Term-End Examination
June, 2008

ET-535(A) : ELEMENTARY HYDROLOGY

Time : 3 hours

Maximum Marks : 70

Note : Question no. 1 is **compulsory**. Answer any **four** from the remaining questions. Give neat and labelled sketches.

1. Fill in the blanks :

- (a) Movement of water from one soil zone to a lower soil zone is called _____ .
- (b) The saturated adiabatic lapse rate in atmosphere is about _____ .
- (c) The average annual precipitation of India is estimated as _____ .
- (d) The standard Symon's type rain-gauge has a collecting area of diameter _____ .
- (e) A hyetograph is a plot between _____ vs. time.
- (f) Lysimeter is used to measure _____ .

- (g) Binnie's percentages curves are developed based on measured runoff from a small catchment near _____ .
- (h) A hydrograph is a plot of _____ against time.
- (i) A unit hydrograph has one unit of _____ .
- (j) An accuracy of about _____ percent may be achieved in the discharge estimation based on measurement by floats. 10×1=10
2. Draw self-explanatory sketch of the hydrologic cycle. Explain the various important processes that make up the cycle. 5, 10
3. (a) Define various forms of precipitation.
- (b) Describe the salient characteristics of precipitation in India. 7, 8
4. Explain any five factors affecting evaporation. Draw ISI Standard Pan used for evaporation measurement. 10, 5
5. (a) Describe the procedure for measurement of infiltration using Double-Ring infiltrometer. What are its main disadvantages ?
- (b) Draw and explain the typical shape of an infiltration capacity curve. 9, 6

6. (a) What are the factors influencing runoff ? Explain Khosla's formula for runoff estimation.
- (b) For a catchment, the mean monthly rainfall and temperature are given as below. Calculate the annual runoff coefficient by Khosla's formula.

8, 7

Month	Temp. °C	Rainfall (cm)
1	12	4
2	16	4
3	21	2
4	27	0
5	31	2
6	34	12
7	31	32
8	29	29
9	28	6
10	29	2
11	19	1
12	14	2

7. (a) Explain the direct and indirect determination of discharge.

- (b) Explain the Area-Velocity method and Slope-Area method of discharge measurement.

5, 10

8. (a) Draw a typical hydrograph and explain its components. Define base flow and inflection point.
- (b) Define unit hydrograph and synthetic unit hydrograph.

10, 5

