No. of Printed Pages : 4

ET-535(A)

B.Tech. Civil (Construction Management)

Term-End Examination

00565

June, 2017

ET-535(A) : ELEMENTARY HYDROLOGY

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions. All questions carry equal marks. Use of scientific calculator is permitted. Assume any data, if required.*

1. (a) Define hydrology. Enumerate the sciences associated with hydrology. Also draw the hydrological cycle with a neat sketch. *10*

(b) What factors are responsible for atmospheric circulation ? *4*

2. Discuss in detail any two types of recording gauges with neat sketches. *14*

3. (a) How will you estimate the missing precipitation data at a given rain gauge station ? Also explain double mass curve analysis as applied to rainfall data. 7

(b) Describe the various methods to find the average depth of precipitation over a catchment. 7

4. (a) A reservoir with a surface area of 250 hectares had the following average values of parameters during a given week : Water temperature = 20°C, relative humidity = 40% and wind velocity 1·0 m above the ground = 16 km/hr.

Estimate the average daily evaporation from the lake and the total volume of water evaporated from the lake during that one week. (e_w = 17·54 mm of Hg) 5

(b) Explain in detail Penman's equation to estimate potential evapotranspiration. 9

5. (a) What are the experimental methods to measure infiltration ? Explain any one of them. 10

(b) Define ϕ-Index and W-Index. 4

6. For a catchment in Uttar Pradesh, the mean monthly rainfall and temperature are given as below. Calculate the annual runoff coeffient by Khosla's formula. 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	16
10	29	2
11	19	1
12	14	2

(b) What are the direct methods of discharge measurement in a stream channel ? 7

7. (a) The velocity of float in a stream was observed to be 3·0 m/s. Compute the average flow velocity corresponding to this observation. Adopt a reasonable value of required coefficient and explain as to why this coeffient is needed. 7

(b) What is the slope-area method of discharge measurement ? Derive the expression. 7

8. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

(a) Precipitation

(b) Potential Evapotranspiration

(c) Base Flow

(d) Infiltration

(e) Hydrograph

(f) Hyetograph

(g) Mass Curve
