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ET-535(A)(S)

B.Tech. Civil (Construction Management)

Term-End Examination

00173

December, 2016

ET-535(A)(S) : 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 missing data, if any.*

1. (a) What is insolation ? Explain its role in hydrologic cycle. Describe in brief, the factors upon which the amount of radiant energy depends. 7

(b) Describe the factors that are responsible for atmospheric circulation. 7

2. (a) Enlist different types of recording rain gauges. Explain the working of any one of these. 7

(b) Estimate the depth of rainfall over the watershed within which the following isohytes could be drawn. The storm centre can be assumed to be near the centre of the watershed and the boundary of the catchment can be assumed to coincide with the outermost isohyte. 7

Isohyte (mm)	Area enclosed (km^2)
21	543
19	2030
17	2955
15	3535
13	3880
11	4310

3. (a) Describe the effect of the following factors on evaporation : $7\frac{1}{2}$

(i) Barometric pressure

(ii) Water quality

(iii) Size and shape of water surface

(b) Explain the energy-balance method for determination of lake evaporation. $6\frac{1}{2}$

4. (a) What is the difference between depression storage and surface detention ? Relate the rate of depression storage to the rate of rainfall and the rate of infiltration. 7

(b) What in ϕ-index ? Discuss the practical importance of ϕ-index. 7

5. (a) Enlist the factors that affect the distribution of run-off in time. Discuss any four of these factors. 7

(b) For the given catchment, the mean monthly rainfall and temperature are given in the table below. Calculate the annual run-off coefficient by Khosla 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

6. (a) Describe the slope-area method of discharge measurement. 7

(b) What is hydrograph ? Draw a typical hydrograph shape and explain its three important segments. 7

7. Write short notes on any ***four*** of the following :

$$4 \times 3\frac{1}{2} = 14$$

(a) Current Meter

(b) W-index

(c) Base Flow

(d) Interception Loss

(e) Hydrometeorology