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ET-535(A)

B.Tech. Civil (Construction Management)
Term-End Examination
December, 2015

ET-535(A) : ELEMENTARY HYDROLOGY

Time : 3 hours *Maximum Marks : 70*

Note : *Question no. **1** is **compulsory**. Answer any **four** from the remaining questions. All questions carry equal marks. Draw neat sketch wherever required. Use of scientific calculator is permitted.*

1. State whether the following statements are *True* or *False* : $7 \times 2 = 14$

(a) The rate of decrease of temperature of dry air in troposphere is approximately 5·6 °C/km.

(b) The standard raingauge used in India has collecting area of diameter = 20 cms.

(c) Interflow is amount of rainfall which contributes to the groundwater (aquifer).

(d) Double mass curve is used to compute average rainfall over an area.

(e) A unit hydrograph has unit depth of direct surface runoff.

(f) W-index and ϕ-index vary from storm to storm.

(g) Dilution technique is used for silt measurement in river water.

2. (a) Draw a self-explanatory block diagram representing the hydrologic system. *7*

(b) Explain the formation of precipitation and various forms of precipitation. *7*

3. (a) The isohyets due to a storm in a catchment have the following data. Estimate the mean precipitation due to the storm. *10*

Isohyets (cm)	Area (km^2)
12	60
12 – 10	140
10 – 8	100
8 – 6	80
6 – 4	20

(b) Describe the procedure to estimate the water equivalent of a given snowfall. *4*

4. Define the following terms : *7×2=14*

(i) Interception

(ii) Evapotranspiration

(iii) Infiltration

(iv) Double mass curve

(v) Pan coefficient

(vi) Interflow

(v) Direct runoff

5. (a) Explain the various factors affecting evaporation. *6*

(b) Draw a neat sketch with dimensions of the ISI modified Class-A Pan and explain the procedure for measurement of evaporation. *8*

6. (a) Enumerate the Direct and Indirect determination of discharge. *7*

(b) Explain the Slope-Area method of discharge measurement. *7*

7. (a) Give steps involved in derivation of a Unit Hydrograph from a Storm Hydrograph. *4*

(b) Given the ordinates of a 4-h Unit Hydrograph as below. Derive the ordinates of a 12-h Unit Hydrograph for the same catchment. *10*

Time (h)	0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44
Ordinate of 4-h UH	0, 20, 80, 130, 150, 130, 90, 52, 27, 15, 5, 0