Term Evaluation (Odd) Semester Examination September 2025

Roll no.....

Name of the Course: B.Tech. Civil Engineering
Semester: Vth
Name of the Paper: *Hydrology and Irrigation Engineering*
Paper Code: TCE-504
Time: 1.5 hour **Maximum Marks: 50**

Note:
(i) Answer all the questions by choosing any one of the sub-questions
(ii) Each question carries 10 marks.

Q1. (10 Marks) **CO-1**

a. Draw a neat sketch of an automatic rain gauge (Float type) and describe its working.

OR

b. The following are the rain gauge observation during a storm, construct

i. Mass curve of precipitation

ii. Hyetograph

Time since commencement of storm (min)	5	10	15	20	25	30	35	40	45	50
Accumulated rainfall (cms.)	0.1	0.2	0.8	1.5	1.8	2.0	2.5	2.7	2.9	3.1

Q2. (10 Marks) **CO-1**

a. Discuss briefly the Horton's method of determining the infiltration capacity of very large basins?

OR

b. Station "X" failed to report the rainfall recorded during a storm. With respect to east-west and north-south axes set up at station "X", the coordinates of 4-surrounding gauges, which are nearest to station "X" in respective quadrants are (10,15), (-8,5), (-2,-9) and (5,-15) km respectively. Determine the missing rainfall at station "X", if the storm rainfalls at the four surrounding gauges are 73, 89, 68 and 57 mm respectively.

Q3. (10 Marks) **CO-2**

a. Discuss the factors affecting runoff from a catchment.

OR

b. The ordinates of a 3-h UH for a basin are given.Derive the flood hydrograph due to a 3-h storm producing ER of 4 cm.Assume constant base flow of 1 cumec.

Time (hr)	0	3	6	9	12	15	18	21	24	27
3-hr UHGO	0	1.5	4.5	8.6	12.0	9.4	4.6	2.3	0.8	0

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Q4. (10 Marks) **CO-2**

a. Describe the procedure of deriving the ordinates of UH from the given ordinates of flood hydrograph. Discuss the various methods of base flow separation.

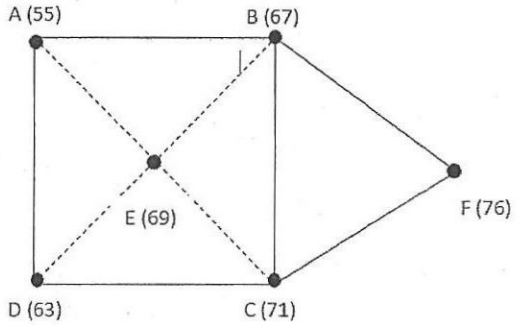
OR

b. The ordinates of a 4-hr UH for a particular basin are given below, Derive the ordinates of S-curve hydrograph

Time(hr)	0	2	4	6	8	12	14	16	18	20	22	24
4-hr UHGO	0	25	100	160	190	170	110	70	30	8	3	0

Q5. (10 Marks) **CO-1**

a. Find the mean precipitation for the area sketched below by Theisson method. The area is composed of a square plus an equilateral triangular plot of side 3 kms. Rainfall readings in mm at the various stations are given. Check the same by arithmetic average method.



OR

CO2

b. The 6-hr unit hydrograph of a catchments is in the form of a triangle with the peak of 100 m^3/s occurring at 24 hr from the start. The base is 72 hr

i. What is the area of the catchments represented by this unit hydrograph

ii. Calculate the flood hydrograph due to storm of rainfall excess 2 cm during 6-hr. The base flow can be assumed to be 25 m^3/s constant throughout