

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023**

Semester : Semester VI & VI - 2020

Course Code : CIV2010

Course Name : Sem VI & VI - CIV2010 - Hydrology and Irrigation Systems

Program : CIV

Date : 12-APR-2023

Time : 2PM - 3.30PM

Max Marks : 60

Weightage : 30%

Instructions:

- (i) Read all questions carefully and answer accordingly.*
- (ii) Question paper consists of 3 parts.*
- (iii) Scientific and non-programmable calculator are permitted.*
- (iv) Do not write any information on the question paper other than Roll Number.*

PART A

ANSWER ALL THE QUESTIONS

(5 X 4 = 20M)

1. Precipitation happens when water falls down to Earth's surface. Distinguish between Convective and Orographic precipitation
(CO1) [Knowledge]
2. List the major activities in which hydrological studies are important
(CO1) [Knowledge]
3. Evaporation is the process by which a liquid changes to gaseous state at the free surface through transfer of heat energy. Enlist any four methods to control Evaporation from lakes
(CO2) [Knowledge]
4. Define Evapotranspiration. Enlist any four factors affecting Evapotranspiration
(CO2) [Knowledge]
5. Define precipitation. List any four forms of precipitation
(CO1) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(4 X 6 = 24M)

6. The hydrological equation states that $\text{Runoff} = \text{Rainfall} - \text{Losses}$. Hence the runoff from a watershed resulting due to a storm is dependent on the losses. Losses may occur due to Evaporation, Evapotranspiration and Infiltration. With a neat diagram, illustrate the process of measuring infiltration rate using Infiltration capacity curve (Horton curve)

(CO2) [Comprehension]

7. For a drainage basin of 600 square kilometers, isohyets drawn for a storm gave following data:

Isohyets interval (cm)	15-12	12-9	9-6	6-3	3-1
Inter-Isohyetal area (Square Kilometers)	92	128	120	175	85

Estimate the average depth of precipitation over the catchment

(CO1) [Comprehension]

8. The rainfall is measured in mm or cm as the depth of water. The most commonly used non-recording rain gauge is Symon's rain gauge. Illustrate with a neat sketch, the working of symon's non recording gauge and also mention its demerits.

(CO1) [Comprehension]

9. The isohyets due to a storm in a catchment were drawn and the area of the catchment bounded by isohyets were tabulated as below.

Isohyets interval (cm)	45 -55	55-65	65-75
Inter-Isohyetal area (square Kilometers)	500	1000	2000

Estimate the mean precipitation due to storm.

(CO1) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

(2 X 8 = 16M)

10. A catchment has six rain gauge stations. In a year, the annual rainfall recorded by the gauges are as follows:

Station	A	B	C	D	E	F
Rainfall (cm)	82.6	102.9	180.3	110.3	98.8	136.7

For a 10% error in the estimation of the mean rainfall, calculate the optimum number of stations in the catchment.

(CO1) [Application]

11. a) With the help of neat diagram explain working of Simple (Tube Type) Infiltro-meters
b) A 3-hour storm on a small drainage basin produced rainfall intensities of 3.5 cm/hr, 4.2 cm/hr and 2.9 cm/hr in successive hours. If the surface runoff due to the storm is 3 cm, then the value of ϕ -index will be?

(CO2) [Application]