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**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING  
END TERM EXAMINATION - JUN 2023**

**Semester :** Semester IV - 2021

**Course Code :** CIV2010

**Course Name :** Sem IV - CIV2010 - Hydrology and Irrigation Systems

**Program :** CIV

**Date :** 9-JUN-2023

**Time :** 9.30AM - 12.30PM

**Max Marks :** 100

**Weightage :** 50%

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**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.*
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**PART A**

**ANSWER ALL THE QUESTIONS**

**(6 X 5 = 30M)**

1. Differentiate surface and subsurface irrigation.  
(CO4) [Knowledge]
2. What is canal irrigation? Give the classification of canal based on purpose.  
(CO4) [Knowledge]
3. Write the physiographic and climatic factors affecting runoff hydrograph.  
(CO3) [Knowledge]
4. Define evaporation. Enlist the factors affecting evaporation.  
(CO2) [Knowledge]
5. What is catchment area? write any two equation on waterbudget for a catchment area.  
(CO1) [Knowledge]
6. Define Duty, Delta and base period. Write the equation showing relationship between duty, delta and base period of a crop.  
(CO4) [Knowledge]

**PART B**

**ANSWER ALL THE QUESTIONS**

**(4 X 10 = 40M)**

7. The rainfall measured by a rain gauge is called point precipitation because it represents the rainfall pattern over a small area surrounding the rain gauge station. Identify a non recording raingauge instrument and explain the same with neat sketch.

(CO1) [Comprehension]

8. The water entering the soil at the ground surface after overcoming resistance to flow is called infiltration. With neat sketch explain the method of determining infiltration rate using Infiltration capacity curve (Horton curve) and  $\phi$  - index method.

(CO2) [Comprehension]

9. Water logging can be a major constraint to plant growth and production under certain conditions, will cause plant death. Explain the causes and effects of water logging.

(CO4) [Comprehension]

10. Water is distributed through a system of pipes usually by pumping, then it is sprayed into the air in order to irrigate the crops. Identify the method of irrigation and discuss its merits and demerits

(CO4) [Comprehension]

**PART C**

**ANSWER ALL THE QUESTIONS**

**(2 X 15 = 30M)**

11. a) Explain the components of unit hydrograph with neat sketch  
b) Given below are the ordinates of a 6-h unit hydrograph for a catchment. Calculate the ordinates of the DRH due to a rainfall excess of 3.5 cm occurring in 6 h.

Time (h)	0	3	6	9	12	15	18	24	30	36	42	48	54	60	69
UH ordinate (m <sup>3</sup> /s)	0	25	50	85	125	160	185	160	110	60	36	25	16	8	0

(CO3) [Application]

12. a) The left branch canal carrying a discharge of 20 cumecs has culturable commanded area of 20000 hectares. The intensity of rabi crop is 80 percent, and the base period is 120 days. The right branch canal carrying a discharge of 8 cumecs has culturable commanded area of 12000 hectares, intensity of irrigation of rabi crop is 50 percent, and the base period is 120 days. Compare the efficiencies of the two canal systems  
b) A water course has a CCA of 1000 hectares. The intensity of irrigation for crop A is 40% and for crop B is 45%, both crops being rabi crops. Crop A has a kor period of 20 days and crop B has kor period of 15 days. Calculate the discharge of the water course if the kor depth for crop A is 20 cm and for crop B its is 15 cm.

(CO4) [Application]