PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023

Semester : Semester VI - 2020
Course Code : CIV2010
Course Name : Sem VI - CIV2010 - Hydrology and Irrigation Systems
Program : CIV

Date : 7-JUN-2023
Time : 9.30AM-12.30PM
Max Marks : 100
Weightage : 50%

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   (6 X 5 = 30M)

1. Explain the working of simple (tube Type) Infiltro-meters with the help of neat sketch.

    (CO2) [Knowledge]

2. Define the following Irrigation terminologies
    a) Duty   b) Delta   c) Crop period   d) Base period e) Consumptive Use of Water

    (CO4) [Knowledge]

3. Define precipitation. Explain Orographic precipitation with the help of neat sketch

    (CO1) [Knowledge]

4. Define surface irrigation and list the objectives of Irrigation

    (CO4) [Knowledge]

5. When water table reaches up to or near to ground level then such a land is called as water logged. Discuss the methods to control water logging

    (CO3,CO4) [Knowledge]

6. Define canal Irrigation and give the classification of canal based on size

    (CO4) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS   **(4 X 10 = 40M)**

7. A water course has a Cultarble command area of 1200 hectares. The intensity of irrigation for crop A is 40% and for crop B is 35%, 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 10 cm and for crop B it is 16 cm.

(CO4) [Comprehension]

8. Explain when you would recommend drip irrigation with respect to type of soil, crop, climate and water. Also list the advantageous and disadvantageous of drip irrigation.

(CO4) [Comprehension]

9. In order to ensure proper planning and operation of lakes, control of evaporation is necessary. Explain the methods to control evaporation from lakes

(CO2) [Comprehension]

10. Given below are the ordinates of a 6-h unit hydrograph for a catchment. Calculate the ordinates of the direct runoff hydrograph due to a rainfall excess of 3.5 cm occurring in 6 h.

Time (h)	6	12	18	24	30	36	42	48	54	60	66
UH ordinate (cubic meter/s)	50	125	185	160	110	60	36	25	16	8	

Also draw the hydrograph showing both 6-hr unit hydrograph and 6-hr direct runoff hydrograph

(CO3) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS   **(2 X 15 = 30M)**

11. a) Explain the method of determining optimum number of rain gauge stations
b) Determine the optimum number of rain gauges in a catchment area using following data
Number of existing rain gauges = 08
Mean annual rainfall at the gauges = 100 cm, 95 cm, 90 cm, 85 cm, 80 cm, 70 cm, 60 cm and 40 cm.
Permissible error = 6%

(CO1) [Application]

12. Determine the frequency of irrigation from the following data
i.Field capacity of soil = 35%
ii.Permanent wilting point = 18%
iii.Dry density of soil = 15 kN/cubic meter
iv.Depth of root zone = 70 cm
v.Daily consumptive use of water = 17 mm
vi.Readily available moisture = 75% of the available moisture

(CO4) [Application]