Question Paper Code: R22A31CE05

R22

ANURAG Engineering College

(An Autonomous Institution)

III B.Tech. I Semester Regular Examinations, December – 2024

WATER RESOURCE ENGINEERING - I

(CIVIL ENGINEERING)

Time: 3 Hours **Max. Marks: 60**

Section – A (Short Answer type questions) (10 Marks)

Answer All Questions

		Course Outcome	B.T Level	Marks
1.	A Catchement has 7 Rainguage stations with an average rainfall and standard deviation as 130.42 cm and 22.54cm. Find the coefficient of variation of rainfall in %?	CO1	L2	1M
2.	Define probable maximum precipitation.	CO1	L1	1M
3.	Compare the advantages and disadvantages of the Double ring infiltrometer.	CO2	L1	1M
4.	Explain the purpose and significance of a Flow Duration Curve	CO2	L2	1M
5.	Explain the basic assumptions underlying the concept of a unit hydrograph	CO3	L2	1M
6.	Illustrate Synthetic Unit Hydrograph	CO3	L1	1M
7.	Define Permeability and transmissibility	CO4	L1	1M
8.	What do you understand by wilting point?	CO4	L2	1M
9.	Explain the concept of canal losses	CO5	L1	1M
10.	What do you mean by canal lining?	CO5	L2	1M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	Identify the ways in which rainfall data is presented, with the help of examples.	CO1	L3	10M
	OR			
B)	i) With a neat sketch, explain the concept of hydrological cycle.	CO1	L2	4M
	ii) The network of 10 sections in and around a river basin have the Theissen Weights of 0.1, 0.06, 0.11, 0.07, 0.08, 0.09, 0.11, 0.12, 0.16 and 0.1 respectively. If the rainfall recorded at these gauges during a storm are 150, 168, 158, 135, 156, 207,138, 162,114 and 132 mm respectively. Determine the average depth of rainfall over the basin by using arithmetic mean method and Theissen polygon Method.		L3	6M
12. A)	i) Describe various methods of estimating evaporation from water bodies	CO2	L2	4M
	ii) A 6-h rainstorm with hourly intensities of 7,18,25,17,11 and 3 mm/h produced a run-off of 39 mm, then the φ -index is		L3	6M
	OR			
B)	The Hortons's Infiltration equation for a basin is given by $f = 6+16e^{-2t}$ where f is in mm/hr and t is in hours. What are the values of f_0, f_c and k? If a storm occurs on this basin with an intensity of more than 22 mm/hr determine the depth of infiltration for the first 45 minutes and the average infiltration rate for the first 75 minutes.	CO2	L3	10M

13. A)	i) Describe the main factors that influence the shape and peak of a flood hydrograph	CO3	L2	5M
	ii) The direct runoff hydrograph of a storm obtained from a catchement is triangular and has a base period of 80 hours. The peak flow rate is 30 m^3/sec and the catchment area is 86.4 km^2. The rainfall excess that has resulted the above hydrograph is		L3	5M
	OR			
B)	The ordinates of 4 hr unit hydrograph are given below Construct S-Curve	CO3	L3	10M

Time(hrs)	0	2	4	6	8	10	12	14	16	18	20
4 hr UHG Ordinates	0	6	33	90	119	103	79	50	25	7	0

14. A)	Explain the terms: specific yield, specific retention, and porosity. How are these three terms related to each other?	CO4	L2	10M
	OR			
B)	What do you understand by crop rotation? What are its advantages?	CO4	L3	10M
15. A)	Design an irrigation channel on Kennedy's theory, to carry a discharge of 55 m^3/sec. Take N = 0.0225 and m = 1.05. The channel has a bed slope of 1 in 6500	CO5	L3	10M
	OR			
B)	What is water logging? What are causes of water logging? What are its ill-effects?	CO5	L2	10M