



R22 Regulation

Subject code: 4E5AA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Supplementary Examinations, May 2025

WATER RESOURCES ENGINEERING-I
(CE)

Maximum Marks: 60

Date: 17.06.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks		(10x1M=10 Marks)	Marks	CO	Bloom Tx
1	What are the different types of precipitations?		1M	1	L1
2	Name the types of rain-gauges		1M	1	L1
3	What is the mean by surface run-off?		1M	2	L1
4	Who introduced unit hydrograph theory		1M	2	L1
5	Define Specific yield?		1M	3	L1
6	Which type of flow is generally considered in the aquifer. Justify?		1M	3	L4
7	How can over-irrigation lead to soil salinization?		1M	4	L1
8	What is drip irrigation primarily used for?		1M	4	L1
9	Name the methods used for design of irrigation canals.		1M	5	L1
10	What is meant by balancing depth of cutting in canals?		1M	5	L1

Part-B

Answer All the following questions.		(5X10M=50Marks)	Marks	CO	Bloom Tx
11	a	Explain various methods of determining average Rainfall over a basin and also discuss the suitability of each method.	5M	1	L2
	b	What is meant by Infiltration? Explain factors effecting Infiltration?	5M	1	L2
OR					
12	a	List factors you consider in selecting for a rain-gauge station.	5M	1	L2
	b	Explain in brief the evaporation process. What are the factors that influence the process of evaporation.	5M	1	L2
13	a	What is run-off? What are the factors that affect the run-off from a catchment area?	5M	2	L
	b	Determine the unit hydrograph of an effective duration of 3 hours. The flood hydrograph due to an isolate storm of 3 hours duration has 6 hours ordinates as under in cumecs: 2; 4; 33; 116; 86; 64; 46; 32; 18; 15; 9; 7; 5; and 3. Assume a base flow of 2 cumecs. The catchment area of the basin is 200 km ² .	5M	2	L3

	OR				
14	a	Define an 'S-curve hydrograph' giving a neat sketch, and state its use.	5M	2	L2
	b	What is flow duration curve and how is it constructed? What are the uses of flow duration curve?	5M	2	L2
15	a	What is Darcy's law? Derive the equation for Darcy's law.	5M	3	L2
	b	A 30 cm well completely penetrates an unconfined aquifer of depth 40 m. After a long period of pumping at a steady state of 1580 lpm, the drawdown in two observation wells 25 m and 75 m from the pumping well were found to be 3.5 m and 2.0 m respectively. Determine the transmissibility of the aquifer. What is the drawdown at the pumping well.	5M	3	L3
	OR				
16	a	Describe various types of tube wells.	5M	3	L2
	b	With a neat sketch explain different types of aquifers.	5M	3	L2
17	a	Define porosity in the context of groundwater. How does porosity influence groundwater storage capacity?	5M	4	L3
	b	What causes water logging, and why is it a concern in irrigated agriculture?	5M	4	L3
	OR				
18	a	What is meant by duty and delta of canal water? Derive a relation between duty and delta for a given base period.	5M	4	L2
	b	Describe the different types of irrigation efficiencies.	5M	4	L2
19	a	Why is Lacey's conception is superior to that of Kennedy's?	5M	5	L3
	b	Describe the properties of canal lining material necessary for arresting the seepage.	5M	5	L2
	OR				
20	a	Describe the variables used in the Rational Formula and explain how each one influences the calculated design discharge.	5M	5	L2
	b	Using Lacey's theory, design an irrigation channel for the following data. Discharge Q= 50 cumecs , Silt factor 'f'=1 .0, Side slopes:1 /2 :1	5M	5	L3