



R22 Regulation

Subject code:4E5AA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Regular/Supplementary Examinations, November 2025

WATER RESOURCES ENGINEERING-I

(CE)

Maximum Marks: 60

Date: 18.11.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 10 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	BloomTx
1.a)	How do you process the rainfall data?	1M	1	L2
b)	List methods used for control of evaporation losses.	1M	1	L1
c)	Enumerate the types of synthetic hydrographs.	1M	2	L1
d)	What is base flow? How do you estimate it?	1M	2	L2
e)	What is specific yield?	1M	3	L1
f)	Define the terms: Well Efficiency and Porosity.	1M	3	L2
g)	What is the relation between duty and delta.	1M	4	L1
h)	Differentiate between sprinkler and drip irrigation.	1M	4	L2
i)	What is canal lining?.	1M	5	L1
j)	What are the limitations of Rational Method?	1M	5	L2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) Explain the procedure involved in the computation of average rainfall over a basin with suitable example. b) There are four rain gauge stations existing in the catchment of a river with station names A, B, C and D with Average annual rainfall of 400mm, 520mm, 600mm and 840mm. Determine the optimum number of rain gauges in the catchment, if it is desired to limit the error in the mean value of rainfall in the catchment to 10%.	5M 5M	1	L2 L2
OR				
3	a) Explain briefly about rainfall double mass curve. b) Explain the scope in measuring the evaporation by Blaney-Criddle method.	5M 5M	1	L2 L2
4	a) Define hydrograph. Draw a single peaked hydrograph and indicate its various Components. b) With neat sketches discuss any two methods of base flow separation.	5M 5M	2	L2 L2
OR				

5	a) Explain about the uses and limitations of Unit hydrograph. b) Using the characteristics given below, develop two hours unit hydrograph for a basin having the water shed area of 400 km ² , the length of the main stream from the basin outlet to the point of string which is nearest to the centroid of basin is 25 km. The coefficient $C_p=0.576$ and $C_t=1.25$.	5M 5M	2	L2 L3
6	How transmissivity and storage coefficient affect well performance? Illustrate the equation for porosity and specific yield.	10M	3	L2
OR				
7	a) Define porosity, specific yield, and specific retention. Write the relation between them. b) A 30 cm diameter well completely penetrates an unconfined aquifer of saturated depth 40 m. After a long period of pumping at a steady rate of 1500 lpm, the drawdown in two observation wells are located at 25 m and 75 m from the pumping well were found to be 3.5 m and 2 m respectively. Determine the transmissibility.	5M 5M	3	L2 L3
8	a) Differentiate between perennial and inundation irrigation. List out the standards of quality for irrigation water. b) Discuss in brief the factors responsible for improving the soil fertility.	5M 5M	4	L2 L2
OR				
9	a) Explain the terms : (i) field capacity (ii) permanent wilting point (iii) ultimate wilting point (iv) available moisture. b) The GCA for an irrigation canal is 20,000 hectares out of which 75% is CCA. The intensity of irrigation is 40% for rabi and 10% for rice. If kor period is 4 weeks for Rabi and 2.5 weeks for rice, determine the outlate discharge, outlet factors for Rabi and rice may be assumed as 1800 ha/cumec and 800 ha/cumec. Also calculate delta for each case.	5M 5M	4	L2 L3
10	Explain about Canal alignments. Discuss the precautions to be considered for canal alignments.	10M	5	L2
OR				
11	Present a detailed comparison between Kennedy's and Lacey's Theories.	10M	5	L2