R20 Regulation *Subject code: 3P6AD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, April 2026

WATER RESOURCE ENGINEERING-I

(CE)

Maximum Marks: 70 Date: 21.04.2026 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 (10X2M=20 Marks)		Marks	CO	BTL
1	What is hydrologic cycle?	2M	1	L1
2	What are the different types of rain gauges?	2M	1	L1
3	Write four types of factors affecting runoff.	2M	2	L1
4	What are the four factors affecting flood hydrograph?	2M	2	L1
5	What is Darcy's law for wells and write it's formula?	2M	3	L1
6	Write about the types of wells.	2M	3	L1
7	What are the two ill effects of irrigation?	2M	4	L1
8	Find the duty of a crop which required a total depth 800mm of water for a bases period of 120 days.	2M	4	L1
9	What are the two types of canal lining?	2M	5	L1
10	What are the IS standards of canal design?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	The average rainfall over 45 hact of watershed for a particular storm was as follows; Time(hr) 0 1 2 3 4 5 6 7 Rainfall(cm) 0 0.5 1.0 3.25 2.5 1.5 0.5 0 The volume of runoff from this storm was determined as 2.25 ha-m. Establish the ϕ- index.	10M	1	L2
	OR			
12	a) Define Infiltration and what is the measurement of infiltration. b) Explain the different factors which affect infiltration.	5M 5M	1	L2
13	a) What are the uses and limitations of unit hydrograph? b) A drainage basin has an area of 3800 sq. km. determine i) Lag period ii) Peak discharge iii) Base period Of a 9-hour unit hydrograph from the following data. L= 320 km, Lca= 200 km, Ct= 0.9, Cp=4.0.	4M 6M	2	L2

	OR			
14	What is unit hydrograph? Write it's limitations and applications.	10M	2	L2
15	Explain briefly the occurrence of ground water with the help of neat sketches.	10M	3	L2
	OR			
16	Describe Darcy's law for radial flow to wells in confined aquifers.	10M	3	L2
17	What are the types of irrigation and write its advantages and disadvantages.	10M	4	L2
	OR			
18	An outlet has 600 hect, out of which only 75% is culturable. The intensity of irrigation for rabi kharief seasons are 70% and 30% respectively. Assuming losses in conveyance system as 10% of the outlet discharge, determine the discharge at the head of the irrigation channel. Take outlet discharge factor for rabi season as1500 hect/cumecs and for kharief season as 750 hect/cumecs.	10M	4	L2
19	a) What is canal? Explain two classifications in brief. b) Discuss the merits and demerits of Lacey's theory and Kennedy's theory.	5M 5M	5	L2
	OR			
20	Using kennedy's theory, design a channel section with the following data; Discharge =16 cumecs Kutter's N =0.0225 Critical velocity ratio =1.0 Side slope =1/2 horizontal to 1 vertical Bed slope =1/5500	10M	5	L2