R20 Regulation *Subject code: 3P6AD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, February 2024

WATER RESOURCE ENGINEERING-I

(Civil Engineering)

Maximum Marks: 70 Date: 22.02.2024 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 which carries 10M.**
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)		CO	Bloom Tx
1	What are the types of precipitation?	CO1	L1
2	What are the types of infiltration indices?	CO1	L1
3	Define base flow.	CO2	L2
4	What is meant by hydrograph analysis?	CO2	L1
5	What are the different types of aquifers?	CO3	L1
6	Define porosity.	CO3	L1
7	Define Duty and Delta.	CO4	L1
8	What type of soil present in India for irrigation?	CO4	L1
9	What is the difference between the lake and a canal?	CO5	L1
10	What is meant by detention storage?	CO5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)			
11	A. What are the different types of rain gauges, explain in brief. (5M) B. Distinguish between the potential evapotranspiration and the actual evapotranspiration. (5M)	CO1	L1 L2
	OR		
12	A. What are the factors affecting runoff over a catchment (5M) B. The average annual rainfalls of 5 rain gauges in a basin are 89,54,45,41 and 55 cm. If the error in the estimation of basin mean rainfall should not exceed 10%, how many additional gauges should be installed in the basin? (5M)	CO1	L1 L3
13	The following are the ordinates of a 12-hour unit hydrograph. (10M)	CO2	L3

Time (hr)	0	12	24	36	48	60	72	84
Flow (m^3/s)	0	1600	2900	2600	1400	700	150	0

If successive 12-hour rainfall excesses are 1.5 cm, 3.0 cm and 0.75 cm fo the catchment, obtain the ordinates of a resulting storm hydrograph, if constant base flow of 20 m^3 /s is assumed.

OR

14	A. Describe the method of deriving unit hydrograph from complex storms. (7M) B. Explain any one method of base flow separation. (3M)	CO2	L2
15	A. Define the terms aquiclude and aquitard. (2M) B. A well penetrates into an unconfined aquifer having a saturated depth of 100 m. The discharge is 250 lit/min at 12 m drawdown. Assuming equilibrium flow conditions and a homogeneous aquifer, estimate the discharge at 18 m drawdown. The distance from the well where the drawdown influences are not appreciable may be taken to be equal for both the cases. (8M)	CO3	L1 L3
	OR		
16	A. State Darcy's law. Write the limitations of its applicability. (5M) B. Compare shallow dug wells and deep dug wells. (5M)	CO3	L1
17	A. Discuss the various methods of surface irrigation. (4M) B. Describe the step by step procedure for preparation of land for irrigation. (6M)	CO4	L1 L2
	OR		
18	A. What are the various types of irrigation? Explain in detail. (7M) B. Write short notes on Crop Period and Crop Ratio. (3M)	CO4	L1
19	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 (10M)	CO5	L3
	OR		
20	A. Why is Lacey's conception being superior to that of Kennedy's? (3M) B. Using Lacey's basic regime equations derive an expression for Lacey's scour depth. (7M)	CO5	L2 L3