Q.P. Code: 16CE120 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech III Year I Semester Supplementary Examinations August-2022

WATER RESOURCES ENGINEERING I

(Civil Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	**a**	What do you understand by precipitation? Explain types and forms of precipitation	**L1**	**6M**
	b	A precipitation station X was in operative for some time during which a storm occurred. The storm total at three station A, B, C surrounding X of were respectively 6.6, 4.8 and 3.7 cm. Normal annual precipitation amounts at station X, A, B and C respectively 65.6, 72.6, 51.8 and 38.2 cm. Estimate the precipitation for station X.	**L2**	**6M**

OR

2	**a**	Describe the various methods of missing rainfall data?	**L1**	**6M**
	b	Explain briefly non-automatic rain gauge.	**L1**	**6M**

UNIT-II

3	**a**	Explain Construction and Limitations of Unit Hydrograph analysis	**L1**	**6M**
	b	What do you understand by infiltration index? How do you determine it?	**L1**	**6M**

OR

4	**a**	What is infiltration? What are the factors affecting of infiltration?	**L1**	**6M**
	b	What do you understand by unit hydrograph? How is it derived? Explain its use in construction of flood hydrograph resulting from two or more periods of rainfall.	**L1**	**6M**

UNIT-III

5	**a**	Derive an expression for discharge from a well penetrating a confined aquifer.	**L1**	**6M**
	b	A gravity well has a diameter of 60 cm. The depth of water in the well 40 m before pumping is started. When is pumping is being done at the rate of 2000 l/min, the drawdown in a well 10 m away is 4 m and in another well 20 m away is 2 m. Determine: i) Radius of zero drawdown, ii) Coefficient of permeability.	**L2**	**6M**

OR

6	**a**	Explain the method of determining the coefficient of transmissibility of a confined aquifer by pumping out test. How can this method be extended for unconfined aquifer?	**L1**	**6M**
	b	A well penetrates fully of 10 m thick water bearing stratum of medium sand having coefficient of permeability 0.005 m/sec. The well radius is 10 cm and is to be worked under a drawdown of 4 m at the well face. Calculate the discharge from the well. What will be the percentage increase in the discharge if the radius of the well is doubled? Take R=300 m in each case.	**L2**	**6M**

UNIT-IV

7	**a**	Define Irrigation and explain the necessity of irrigation.	**L1**	**6M**
	b	A water course commands an irrigated area 1000 hectares. The intensity of irrigation of rice, crop takes 15 days and during transplantation period, total depth of water required by the crop on the field is 500 mm. During the transplantation period, the useful rain falling on the field is 120 mm. Find the duty of irrigation water for crop on the field during transplantation at the head of the field and also at the head of the water course, assuming loss of water to be 20% in the water course. Also, calculate the discharge required in the water course.	**L2**	**6M**

OR

8	**a**	What do you understand by crop rotation? What are its advantages?	**L1**	**6M**
	b	Explain the assessment of irrigation water.	**L1**	**6M**

UNIT-V

9	**a**	What are the types of channels and explain it.	**L1**	**6M**
	b	For a channel, the discharge (Q), rugosity (N), critical velocity ratio (m) and the bed width –depth ratio (B/D) are given. Explain how you would design the channel using Kennedy's theory.	**L2**	**6M**

OR

10	**a**	Explain the defects in Lacey's theory.	**L1**	**6M**
	b	Using Lacey's theory, design a irrigation channel for the following data: Discharge Q= 50 cumecs, Silt factor f=1, Side slopes=0.5:1	**L2**	**6M**

*** END ***