R19

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech IV Year I Semester Regular Examinations November/December-2022
HYDROLOGY, GROUND WATER & WELL ENGINEERING
(Agricultural Engineering)

Time: 3 hours   Max. Marks: 60

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

UNIT-I

1 a For the catchment area shown in fig, the details of thiessen polygon surrounding each rain guages and recording of the rain guages in the month of August 2020 are given below.   L1   10M

Rainguage station	1	2	3	4	5	6
Thiessen ploygon area (m²)	720	380	440	1040	800	220
Recorded rainfall in mm	121	134	145	126	99	115

Determine the average depth of rainfall on the basin by arithmetic mean method and thiessen mean method

b Explain briefly about rain guage?   L1   2M

OR

2 Write the different methods of presentation of rainfall data with suitable diagram?   L2   12M

UNIT-II

3 a Explain about Snyder's synthetic unit hydrograph.   L2   9M

b Define basin lag, peak flow and time base of unit hydrograph.   L2   3M

OR

4 a Write the basic assumptions constitute the foundation for unit hydrograph.   L2   5M

b Explain the derivation of unit hydrograph.   L2   7M

UNIT-III

5 a State Darcy's law and derive Darcy's equation.   L1   9M

b Write the validation of Darcy's law.   L2   3M

OR

6 What are the properties of aquifer and explain them in brief.   L2   12M

UNIT-IV

7	a	Determine aquifer parameters by using Theis method.	L3	6M
	b	Drawdown was measured during a pumping test at frequent intervals in an observation well 200 ft from a well that was pumped at a constant rate of 500 ppm. Based on pump test data the value of W(u) is 1, drawdown 's' is 1 ft, 1/u is 1 and time t is 2 min. these measurements shows that the water level is still dropping after 4000 minutes of pumping. Therefore analysis of the data requires use of Theis method non-equilibrium procedure. Determine S and T for the aquifer.	L2	6M

OR

8	a	Describe Chow's method of solution to determine the aquifer parameters.	L3	4M
	b	Discuss briefly about well interference in confined and unconfined aquifer systems with neat labelled diagram.	L2	8M

UNIT-V

9	a	Mention the different artificial recharge techniques.	L1	6M
	b	What is biogas? Explain the types of biogas plants in brief.	L1	6M

OR

10	a	A pump lifts 100,000 litres of water per hour, against a total head of 20 metres. Compute the water horse power. If the pump has an efficiency of 75 %, what size of prime mover is required to operate the pump? If a direct drive electric motor with an efficiency of 80 per cent is used to operate the pump, compute the cost of electrical energy in a month of 30 days. The pump is operated for 12 hours daily for 30 days. The cost of electrical energy is 20 paise per unit.	L4	5M
	b	What is hydraulic ram? Describe the construction of hydraulic ram.	L2	5M
	c	What are the types of solar powered water pumping system.	L1	2M

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