O.P.Code: 20AG0714	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year II Semester Regular & Supplementary Examinations June-2025
IRRIGATION & DRAINAGE ENGINEERING
(Agricultural Engineering)

Time: 3 Hours **Max. Marks: 60**

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

UNIT-I

1	a	Define irrigation and necessity of irrigation? Explain advantages and dis-advantages of irrigation?	CO1	L2	6M
	b	A wheat crop require 40 cm depth of irrigation water over a base period of 120 days, find the duty of the crop in flow units and also in quantity units.	CO1	L2	6M

OR

2	a	Define the following: (i) Saturation capacity (ii) Field capacity (iii) Permanent wilting point (PWP) (iv) Moisture equivalent (v) Gross irrigation area (GIA).	CO1	L2	6M
	b	An irrigation canal has gross commanded area of 80,000 hects. Out of which 85% is culturable irrigable. The intensity of irrigation for kharif season is 30% and for Rabi season is 60%. Find the discharge required at the head of canal if the duty at its head is 800 hect/cumec for kharif and 1,700 hect/cumec for rabi season.	CO1	L3	6M

UNIT-II

3	a	What are the inventory resource and parameters required for design of sprinkler.	CO2	L2	6M
	b	A sprinkler system 18m spacing along the main and 12m along the laterals is used to irrigate crop grown on coarse sandy soil over compact soil land slope of 3%. Twenty sprinklers are used to irrigate field. Optimum application rate 3.75cm/hr. Determine the total system capacity.	CO2	L3	6M

OR

4	a	Determine the uniformity co-efficient from the following data obtained from a field test on a square Plot bounded by four sprinkler Sprinkler - 4.365×2.381 MM nozzles at 2.8 kg/cm2 Spacing – 24M×24M Wind – 3.5 Km/hr. from South-West Humidity – 42% Time of test – 1.0 hr. S- Location of sprinklers	CO2	L3	6M

S	8.9	7.6	6.6	S
8.1	7.6	9.9	10.2	8.3
8.9	9.1	9.1	9.4	8.9
9.4	7.9	9.1	8.6	9.1
S	7.9	6.6	6.8	S

	b	Explain system capacity, Discharge through sprinkler, Height of sprinkler, sprinkler spacing, Discharge through sprinkler, water application rate.	CO2	L2	6M

UNIT-III

5	a	Explain the principle of hydro cyclone filter and what are the factors influencing the effective fertigation.	CO3	L2	6M
	b	Define fertigation and explain advantages, limitation of fertigation?	CO3	L2	6M

OR

6	a	Briefly explain the venture injection fertilizer method advantages and dis advantages with neat diagram.	CO3	L2	6M
	b	Briefly explain the pressure differential fertigation method.	CO3	L2	6M

UNIT-IV

7	a	Define water logging, List and explain the causes and impact of water logging.	CO4	L2	6M
	b	Write a short note on Drainage porosity and drain Envelopes in tile drainage system.	CO4	L2	6M

OR

8	a	Explain in detail the design of subsurface drainage system.	CO4	L3	6M
	b	Derive Hooghoudt equation with neat diagram.	CO4	L3	6M

UNIT-V

9	a	Explain the methods involved in determination of hydraulic conductivity	CO5	L5	6M
	b	Explain in detail about the steady state equation used in pipe flow.	CO5	L5	6M

OR

10	a	Briefly explain about indices used in economic evaluation of drainage system.	CO6	L4	6M
	b	Write a short note on comparison of steady and unsteady state equation.	CO5	L3	6M

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