

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech. III Year I Semester Regular Examinations December-2025**

**WATER RESOURCES ENGINEERING**

(Civil Engineering)

**Time: 3 Hours**

**Max. Marks: 70**

**PART-A**

(Answer all the Questions 10 x 2 = 20 Marks)

- |     |   |     |    |    |
|-----|---|-----|----|----|
| 1 a | List various types of rain gauges.  | CO1 | L1 | 2M |
| b   | Define infiltration.  | CO1 | L1 | 2M |
| c   | Differentiate aquifer and aquiclude.  | CO2 | L2 | 2M |
| d   | Define storage coefficient.   | CO2 | L1 | 2M |
| e   | Find the delta for a crop when its duty is 864 hectare/cumec on the field, the base period of the crop is 120 days. | CO3 | L3 | 2M |
| f   | List types of irrigation.   | CO3 | L1 | 2M |
| g   | Define water logging.   | CO4 | L1 | 2M |
| h   | Sketch cross section of a canal.  | CO4 | L2 | 2M |
| i   | Differentiate storage and diversion head work.  | CO5 | L2 | 2M |
| j   | Define uplift pressure.   | CO5 | L1 | 2M |

**PART-B**

(Answer all Five Units 5 x 10 = 50 Marks)

**UNIT-I**

- |     |   |     |    |    |
|-----|---|-----|----|----|
| 2 a | Explain measurement of evaporation using pan measurement method.  | CO1 | L2 | 5M |
| b   | A reservoir with a water surface area of 300 hectares has the following data.<br>Water temperature = 30°C, Relative humidity = 50%, Wind velocity at 1m above ground = 12km/h, Mean barometer reading = 750 mm of Hg. Estimate average daily evaporation from lake using Meyer's and Rohwer's formulae. | CO1 | L4 | 5M |

**OR**

- |     |   |     |    |    |
|-----|---|-----|----|----|
| 3 a | Explain various methods used to calculate runoff.       | CO1 | L2 | 5M |
| b   | Define Design flood and briefly explain its importance. | CO1 | L2 | 5M |

**UNIT-II**

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|---|---|-----|----|-----|
| 4 | Given ordinates of a 4-h unit hydrograph as below. Derive the ordinates of a 12-h unit hydrograph for the same catchment. | CO2 | L4 | 10M |
|---|---|-----|----|-----|

Time (h)	0	4	8	12	16	20	24	28	32	36	40	44
Ordinates of 4-h UH	0	20	80	130	150	130	90	52	27	15	5	0

**OR**

- |     |  |     |    |    |
|-----|--|-----|----|----|
| 5 a | Sketch and explain types of aquifers   | CO2 | L2 | 5M |
| b   | Derive an expression to determine the discharge through the well using Dupit's equation for an unconfined aquifer. | CO2 | L3 | 5M |

**UNIT-III**

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|-----|---|-----|----|----|
| 6 a | Explain advantages and ill effects of irrigation.   | CO3 | L2 | 5M |
| b   | What is the classification of irrigation water having the following characteristics: Concentration of Na, Ca and Mg are 22, 3 and 1.5 milli-equivalents per litre respectively, and the electrical conductivity is 200 micro mhos per cm. What problems might arise in using this water on fine textured soils? What remedies do you suggest to overcome the trouble? | CO3 | L4 | 5M |

**OR**

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|-----|---|-----|----|----|
| 7 a | Describe the procedure for preparation of land for irrigation and soil fertility. | CO3 | L2 | 5M |
| b   | Sketch and explain soil water plant relationship.                                 | CO3 | L2 | 5M |

**UNIT-IV**

- |   |  |     |    |     |
|---|--|-----|----|-----|
| 8 | Classify canal lining and explain briefly. | CO4 | L2 | 10M |
|---|--|-----|----|-----|

**OR**

- |     |  |     |    |    |
|-----|--|-----|----|----|
| 9 a | Explain triangular lined canal section with a neat sketch.   | CO4 | L2 | 5M |
| b   | Design a trapezoidal concrete lined channel to carry a discharge of 350 m <sup>3</sup> /s at a slope of 1 in 5000 with a side slope of 1.5H: 1V. The value of N is 0.014 with a velocity of 2 m/s. | CO4 | L4 | 5M |

**UNIT-V**

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|------|---|-----|----|----|
| 10 a | Sketch and explain the layout of diversion head works and its components. | CO5 | L2 | 5M |
| b    | Discuss Lane Weighted Creep theory.                                       | CO5 | L2 | 5M |

**OR**

- |      |   |     |    |    |
|------|---|-----|----|----|
| 11 a | Write a short note on stream lines and equipotential line | CO5 | L2 | 5M |
| b    | Sketch and explain rock fill weir with sloping apron.     | CO5 | L2 | 5M |

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