

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

B.Tech. IV Year I Semester Regular & Supplementary Examinations December-2024
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 Explain Thiessen polygon method with one example. L2 CO1 6M
b Explain mass curve and hyetograph. L3 CO1 6M

OR

- 2 Explain plotting position by Weibull's method. L2 CO1 12M

UNIT-II

- 3 Explain the factors affecting hydrograph with necessary graphs. L1 CO2 12M

OR

- 4 a Explain S-curve method briefly. L3 CO1 6M
b Explain concept and application of S-curve. L3 CO1 6M

UNIT-III

- 5 a State Darcy's law and derive Darcy's equation. L1 CO3 9M
b Write the validation of Darcy's law. L2 CO3 3M

OR

- 6 In an unconfined aquifer extending over 4 km², the water table was initially at 26 m below the ground surface. Sometime after an irrigation of 20 cm (full irrigation), the water table rises to a depth of 25.5 m below the ground surface. Afterward 1.5x10⁶ m³ of groundwater was withdrawn from this aquifer, which lowered the water table to 27.5 m below the ground surface. Determine: (i) specific yield of the aquifer, and (ii) soil moisture deficit (SMD) before irrigation. L4 CO3 12M

UNIT-IV

- 7 a Describe the four possible approaches for installing well screen and casing in place. L3 CO4 8M

- b Name the methods used for development of wells. L3 CO4 4M

OR

- 8 a Discuss briefly about well interference in confined and unconfined aquifer systems with neat labelled diagram. L2 CO4 8M

- b Discuss the fracturing methods for development of wells. L2 CO4 4M

UNIT-V

- 9 a A hydraulic ram operates at a drive head of 3 m and a delivery head of 20 m. The flow through the drive pipe is 10 l/s and the discharge at the outlet of the delivery pipe is 1.2 l/s. Compute the efficiency of the ram adopting (i) D'Aubuisson's ratio and (ii) Rankine's formula. L1 CO5 3M

- b What are mixed flow pumps and discuss the principle of operation. L1 CO3 5M

- c What are the advantages and disadvantages of vertical turbine pumps. L1 CO5 4M

OR

- 10 Briefly discuss the vertical turbine pump with neat schematic diagram. L1 CO5 12M

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