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

B.Tech IV Year II Semester Regular & Supplementary Examinations July-2021

GROUND WATER HYDROLOGY-WELLS AND PUMPS

(Agricultural Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

- 1 a Write down the equation for porosity, specific yield, transmissibility, hydraulic conductivity. L1 4M
- b State Darcy's law and Write the validation of Darcy's law. L2 4M
- c A field sample of an unconfined aquifer is packed in a test cylinder. The length and diameter of the cylinder are 50 cm and 6 cm, respectively. The field sample is tested for a period of 3 min under a constant head difference of 16.3 cm. As a result, 45.2 cm³ of water is collected at the outlet. Determine the hydraulic conductivity of the aquifer sample. L4 4M

OR

- 2 a Write the classification of aquifer and explain them with neat diagram. L3 6M
- b In an area of 200 ha, the water table declines by 3.5 m. If the porosity of the aquifer material is 30% and the specific retention is 15%, determine: (i) Specific yield of the aquifer, and (ii) Change in groundwater storage. L1 6M

UNIT-II

- 3 a Derive an expression to determine the aquifer characteristics from confined aquifer under steady state condition. L1 6M
- b Explain the back-washing methods for developing wells L2 6M

OR

- 4 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-III

- 5 a Derive equation for power from windmill L3 6M
- b Explain direct methods of artificial groundwater recharge L2 6M