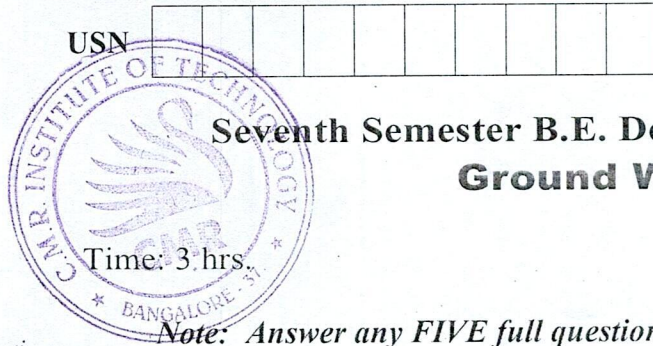


USN

18CV734



Seventh Semester B.E. Degree Examination, June/July 2025

Ground Water Hydraulics

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With a neat sketch, explain the vertical distribution of ground water. (10 Marks)
b. Explain in brief occurrence of ground water in different types of rocks and soils. (10 Marks)

OR

- 2 a. What is an aquifer? Explain different types of aquifer, with neat sketch. (10 Marks)
b. Explain the importance of groundwater. (06 Marks)
c. Explain : (i) Perched aquifer (ii) Aquitard. (04 Marks)

Module-2

- 3 a. With neat sketch, explain Darcy's law. Discuss its validity and limitations. (10 Marks)
b. Define specific yield, specific retention and porosity. Derive a relationship between them. (10 Marks)

OR

- 4 a. Explain storage coefficient with neat diagram in confined and unconfined aquifer. Derive an expression for storage coefficient. (10 Marks)
b. Explain the terms :
(i) Coefficient of permeability.
(ii) Intrinsic permeability.
(iii) Transmissibility.
(iv) Permeability in isotropic soils.
(v) Permeability in anisotropic soils. (10 Marks)

Module-3

- 5 a. Derive an equation for discharge for the case of steady radial flow in a an unconfined aquifer using Dupuit's Theory. List the assumptions and limitations. (10 Marks)
b. A 30 cm well penetrates 50 m below the static water level. After a long period of pumping at rate of 1800 lpm. The drawdown in the wells at 15 and 45 m from the pumped well were 1.7 and 0.8 m respectively. Determine the transmissibility of the aquifer. What is the drawdown in the pumped well? (10 Marks)

OR

- 6 a. Explain Cooper Jacob methods of solutions for unsteady radial flow in a confined aquifer. (10 Marks)
b. What are the assumptions made in Theis Method? Explain Theis method to determine formation constants T and S for unsteady radial flow towards well. (10 Marks)

Module-4

- 7 a. Explain with a neat sketch, the electrical resistivity (surface) method for ground water exploration. (10 Marks)
b. Write short notes on :
(i) Sonic logging.
(ii) Radio active logging.
(iii) Fluid logging. (10 Marks)

OR

- 8 a. Describe ground water exploration using Seismic refraction method. (10 Marks)
b. With a neat sketch, electric logging for ground water exploration. (10 Marks)

Module-5

- 9 a. Explain the different types of tube wells also given the method of construction for any one of the tube well. (10 Marks)
b. With neat sketch, explain the various methods of ground water recharge. (10 Marks)

OR

- 10 a. Explain what is conjunctive use of water, also explain its necessity, advantages and disadvantages. (10 Marks)
b. Describe what are the pumps used for lifting water wells also explain the working principle of centrifugal pump. (10 Marks)
