



CBCS SCHEME

18CV734

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023

Ground Water Hydraulics

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- Explain the vertical distribution of ground water with a neat sketch. (08 Marks)
 - Explain in brief occurrence of ground water in different rocks and soils. (06 Marks)
 - Define the terms : i) Perched aquifer ii) aquiclude iii) Confined aquifer. (06 Marks)

OR

- What is an Aquifer? Explain different types classified based on porosity and permeability properties. (07 Marks)
 - Define the terms :
i) $W_Y < V_v$ ii) $S_v = W_v/V$ iii) $S_Y = W_v/V$ iv) $n = S_r + S_y$ (07 Marks)
 - Explain importance of ground water. (06 Marks)

Module-2

- Explain Darcy's law and discuss the validity and limitations. (08 Marks)
 - It is observed in a field test that 3hr 20min was required for a Tracer to travel from one well to another 20m apart and difference in their water surface elevations was 0.5m samples of the Aquifer between the wells indicated a porosity of 15%. Determine the permeability of Aquifer seepage. Velocity and the Raynold's number for the flow assuming an average grain size of 1mm and kinematic viscosity of water at 27°C is 0.0008 stoke. (12 Marks)

OR

- Explain storage coefficient with a neat diagram. (07 Marks)
 - Write a note well interference or spacing of wells. (05 Marks)
 - An artesian Aquifer 20m thick has a porosity of 20% and bulk modulus of compression 10^8N/m^2 . Estimate the storage coefficient of the Aquifer. What fraction of this is attributable to the expansibility of water? (08 Marks)

Module-3

- Describe the steady Radial flow in confined Aquifer. (10 Marks)
 - A 30cm well fully penetrates a confined Aquifer 30m deep. After a long period of pumping as a rate of 1,200 lpm the draw down in the wells at 20 and 45m from the pumping well are found to be 2.2 and 1.8m respectively. Determine the transmissibility of the Aquifer. What is the draw down in the pumped well? (10 Marks)

OR

- Explain cooper in Jacob method of finding aquifer parameters in a unsteady confined aquifer. (10 Marks)
 - An unconfined aquifer has a thickness of 30m. A fully Penetrating 20cm diameter well in this aquifer is pumped at a rate of 35 lit/s. The draw down measured in two observation well located at distances of 10m and 100m from the well are 7.5m and 0.5m respectively. Determine the average hydraulic conductivity of the Aquifer. At what distance from the well the draw down is significant. (10 Marks)

Module-4

- 7 a. Describe the ground water exploration using seismic method. (10 Marks)
b. Briefly explain the electric logging operation carried out in open hole condition and add a note on Normal and Lateral logging. (10 Marks)

OR

- 8 a. Enumerate the ground water exploration by Electric resistivity method (Schlumberger method) (10 Marks)
b. Explain the sonic logging and fluid logging and ground water exploration. (10 Marks)

Module-5

- 9 a. Explain different types of well and also give the method of construction of any one of the them. (10 Marks)
b. With neat sketches, explain various method of ground water recharge. (10 Marks)

OR

- 10 a. Describe pumps for lifting water form well and also, explain the working principle of centrifugal pump. (10 Marks)
b. Explain the necessity of conjunctive use of water. Also mention advantages and disadvantages of conjunctive use. (10 Marks)
