



Seventh Semester B.E. Degree Examination, June/July 2023
Ground Water and Hydraulics

Time: 3 hrs

Max. Marks: 100

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

Module-1

- 1 a. Describe the following with examples :
i) Aquifer ii) Aquiclude iii) Aquiclude iv) Aquitard (08 Marks)
b. Describe confined and unconfined aquifers with neat sketches. (12 Marks)

OR

- 2 a. Describe the vertical distribution of ground water with neat sketches. (10 Marks)
b. Explain perched aquifer with neat sketches. (04 Marks)
c. Write a note on ground water importance. (06 Marks)

Module-2

- 3 a. 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)
b. What is storage coefficient? Explain its characteristics in confined and unconfined aquifers. (12 Marks)

OR

- 4 a. In an area of 100 hectares the water table dropped by 4.5m. If the porosity is 30% and the specific retention is 10%. Determine :
i) The specific yield of the aquifer
ii) Change in ground water storage (08 Marks)
b. Explain Darcy's law with derivations. (04 Marks)
c. Explain the following :
i) Porosity ii) Specific yield iii) Specific retention iv) Permeability (08 Marks)

Module-3

- 5 a. Pumping at a rate of 1500 lpm from a 30cm diameter test well penetrates into 60m of an unconfined aquifer gives draw-down of 2.0 and 1.10m in observation wells located respectively at 120m and 160m away from it. Calculate :
i) Hydraulic conductivity of the aquifer
ii) Draw down of the pumping well. (10 Marks)
b. Describe the steady radial flow into a well for an unconfined aquifer with neat sketches. (10 Marks)

OR

- 6 a. A 40cm well penetrates 40m into an aquifer screen is provided for the first 15m the yield from the well. The yield from the well is 2500 lpm with the draw down at the well of 4m. If the length of the screen is increased to 25m find the new discharge. (10 Marks)
b. Explain Cooper – Jacob method to determine aquifer parameter for unsteady radial flow. (10 Marks)

Module-4

- 7 a. Describe the following :
i) Electrical Logging (05 Marks)
ii) Sonic Logging. (05 Marks)
- b. Explain the ground water investigation using Electrical Resistivity method. (10 Marks)

OR

- 8 a. Describe the following :
i) Induction Logging (05 Marks)
ii) Fluid Logging (05 Marks)
- b. Describe the ground water investigation using Seismic method. (10 Marks)

Module-5

- 9 a. List different types of pumps and with a neat sketch, explain working of a centrifugal pump. (10 Marks)
- b. With a neat sketch, explain the parts and construction process of DUG well with working principles. (10 Marks)

OR

- 10 a. What is conjunction use of water? Explain its necessity, advantages and disadvantages. (12 Marks)
- b. Describe the different methods of ground water recharge. (08 Marks)
