Unit-I

1. Define the terms (i) Storage Coefficient, (ii) Capacity and (iii) Yield.
2. With the help of a neat sketch identify the various sources of storage and movement of groundwater with reference to the general Hydrologic Cycle.
3. Define the terms (i) Porosity, (ii) Specific Yield and (iii) Specific Retention.
4. State Darcy's law for movement of groundwater in an aquifer. What are the limitations of the same?
5. Write a note on (i) Anisotropy and (ii) Heterogeneity w.r.t. ground water flow through aquifers.
6. Discuss how groundwater is distributed vertically in the form of different zones.
7. Distinguish between Aquifer, Aquifuge and Aquitard giving examples for each of them.

Unit-II

1. Explain the control volume approach for development of groundwater flow equations.
2. State Dupuit- Forchheimer assumptions for two-dimensional ground water flow.
3. Considering the general continuity equation for a derive the "Diffusion Equation" two-dimensional radial flow in to a well located in a confined aquifer.
4. Why Laplace equation cannot be used for flow through an unconfined aquifer? Explain how the same is overcome by Dupuit's assumptions.
5. Derive equation steady state radial flow in to wells in any aquifier.
6. From the first principles arrive at the analytical solution for steady radial flow through a confined aquifer.

Unit-III

1. Explain Cooper-Jacob method for solving the unsteady radial flow into a well in confined aquifer.
2. What is "Well Function"?
3. Write a note on the Recovery Test.
4. What are the inherent assumptions in the non-equilibrium equation of Theis?
5. Write a note on characteristic well losses.
6. Explain the image well theory as applied to groundwater hydraulics.
7. Describe the methodology for analyzing the flow through a leaky aquifer.
8. Explain how a well screen is designed.

Unit-IV

1. Explain the importance of (i) Demand to Supply Ratio and (ii) Base Flow Reduction Index in regional ground water budgeting.
2. List the various methods of recharge estimation. Explain anyone.
3. What are various sources of contamination of ground water.
4. Discuss the methods of treatment of contaminated ground water.
5. Write a note on saline water intrusion sources and its control.
6. Identify various inflows and outflows in a groundwater system and discuss their significance in ground water budgeting.
7. Discuss the distinct processes of groundwater recharge.
8. Discuss various factors that affect groundwater recharge.

Unit-V

1. Explain any one ground water modelling software.
2. Write a note on the basic concepts of Groundwater management.
3. Discuss about the groundwater legislation and its inadequateness.
4. Distinguish between analog and computational models for groundwater.
5. Explain Hele-Shaw model for ground water flow. How does it differ from other models?
6. Write a note on the Indian practices for planning and development of ground water.
7. Discuss in detail about the various types of ground water management models.
8. Discuss various aspects related to development of a ground water model identifying the model objectives and conceptualization of the model.