

Hydrogeology Revised Syllabus as per 2016 Notification (Old Syllabus)

This is old syllabus. It was updated in 2019. The new combined syllabus for both prelims and mains is [here](#)

Section a: Origin, Occurrence and Distribution of Water

- Water on earth;
- Types of water — meteoric, juvenile, magmatic and sea water;
- Hydrological Cycle and its components;
- Water balance;
- Water-bearing properties of rocks — porosity, permeability, specific yield and specific retention;
- Vertical distribution of water;
- Zone of aeration and zone of saturation;
- Classification of rocks according to their water-bearing properties;
- Aquifers;
- Classification of aquifers;
- Concepts of drainage basins and groundwater basins;
- Aquifer parameters- transmissivity and storage coefficient;
- Water table and piezometric surface;
- Fluctuations of water table and piezometric surface;
- Barometric and tidal efficiencies;
- Water table contour maps;
- Hydrographs;
- Springs;
- Geologic and geomorphic controls on groundwater;
- Hydrostratigraphic units;

- Groundwater provinces of India.
- Hydrogeology of arid zones of India;
- Hydrogeology of wet lands.

Section B: Groundwater Hydraulics

- Theory of groundwater flow;
- Darcy's law and its applications;
- Determination of permeability in laboratory and in field;
- Flow through aquifers;
- steady, unsteady and radial flow conditions;
- Evaluation of aquifer parameters of confined, semi-confined and unconfined aquifers - Thiem, Thies, Jacob and Walton's methods;
- Groundwater modelling.

Section C: Groundwater Exploration and Water

- Well Construction Geologic and hydrogeology methods of exploration;
- Role of remote sensing in groundwater exploration;
- Hydrogeomorphic and lineament 'napping';
- Surface geophysical methods — seismic, gravity, geo-electrical and magnetic methods;
- Types of water wells and methods of construction;
- Design, development, maintenance and revitalization of wells;
- Sub-surface geophysical methods;
- Yield characteristics of wells;
- Pumping tests- methods, data analysis and interpretation;

Section D: Groundwater Quality

- Physical and chemical properties of water;
- Quality criteria for different uses;
- Graphical presentation of groundwater quality data;
- Groundwater quality in different provinces in India;
- Groundwater contamination;

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- natural (geogenic) and anthropogenic contaminants;
- Saline water intrusion;
- Radioisotopes in hydrogeological studies.

Section E: Groundwater Management

- Groundwater problems related to foundation work, mining, canals and tunnels;
- Over-exploitation of groundwater and groundwater mining;
- Groundwater problems in urban areas;
- Ground water management in arid and semi-arid areas;
- Climate change impact on groundwater resources;
- Concept of sustainable development of groundwater resources;
- Groundwater management —supply side and demand side management;
- Rainwater harvesting and managed aquifer recharge;
- Conjunctive use of surface and groundwater;
- Groundwater legislation.