

JUNIOR ENVIRONMENTAL ENGINEER

Section-I: Analytical Ability, Computer Skills and Communication Skills **(30 Marks)**

Communication skills; Logical, quantitative and visual-spatial reasoning; Computer skills, computer applications and proficiency in using windows, MS office etc.; General knowledge/current affairs.

Section – II: Professional (70 Marks)

Fluid Flow and Mechanical Operation: Fluid properties and Bernoulli equation; Flow of incompressible Fluids, Laminar and Turbulent Flow in Pipes, Frictional Losses in pipes; Open channel flow; Flow measurement techniques; Pumping systems, pumps and pumping stations; Surface and ground water hydrology; water and wastewater treatment plants and air pollution control devices;

Flow Measurement: Pitot tube, Orifice meter, Venturimeter, Rotameter, and Weir & Notches.

Interaction between humans and environment: The physical environment- land water, and climate; Resources and their management- Natural, technological and human; Concept of sustainability- natural ecosystems and sustainability; Agricultural and Industrial systems from the angles of environment protection;

Water supply and Water Treatment: Sources of water, Water treatment, Types of pipes, laying of pipes. Quality of sewage, laying of sewers, Building drainage and rural sanitation.

Water and wastewater treatment technologies: preliminary, primary, secondary and tertiary treatment technologies; Coagulation-flocculation; Stoke's law and sedimentation or gravity settling; Filtration (slow sand and rapid gravity) and membrane filtration; Disinfection and chlorination; Ion exchange processes; Adsorption; aerobic and anaerobic processes.