Syllabus for Written Examination:

Syllabus for Assistant Executive Engineer (Civil)

(for B .Tech degree holders)

Fluid Mechanics and Hydraulic Machinery:

Properties of fluids, pressure measurement, buoyancy and flotation, fluid kinematics and fluid dynamics, flow through orifices and mouth pieces, notches and weirs, laminar and turbulent flow, flow through pipes, forces on immersed bodies, open channel flow, impact of jets, hydraulic turbines and pumps.

Hydrology and Irrigation Engineering:

Definition of duty, delta, base period, crop period, types of rain gauges, methods of estimating runoff, hydrographs, classification of head works and weirs, distribution works, types of dams, components of dams, forces acting on dams and causes of dam failure, components of hydro power plants.

Strength of Materials:

Simple stresses and strains, Hooke's law, elastic constants, stress strain curve of mild steel bars, temperature stresses, stresses in compound bars, stresses on oblique planes, principal stresses and strains, Mohr's stress circle, shear force and bending moment for beams, torsion of circular shafts, pure torsion, combined bending and thrust, deflection of simple beams, thin and thick cylinders, columns and struts, direct and bending stresses, unsymmetrical bending and shear centre, analysis of trusses, method of joints and method of sections.

Theory of Structures:

Propped cantilevers, fixed beams, continuous beams, arches, cables and suspension bridges, moving loads and influence lines, static and kinematic indeterminacies, moment distribution method, Kani's method and matrix methods of analysis for beams and frames.

Design of Reinforced Concrete Structures:

Material properties, material grades and tests, workability and mix design of concrete, basic design principles in working stress and limit state methods, limit state design of beams, beams, slabs, columns, footings, water tanks, retaining walls, design bridges, IRC specifications and loadings for bridges, slab type and T beam bridges, basic concepts of prestressed concrete, losses in prestressed concrete, design of prestressed beams including end block.

Design of Steel Structures

Riveted and welded joints, tension and compression members, gantry girders, roof trusses, plate girder and truss bridges, water tanks, transmission towers, column bases, basic concept of plastic analysis.

Geotechnical Engineering:
Origin and classification of soils, three phase system, basic definitions and volume relations, consistency limits, soil classification, concepts and tests of permeability of soil, effective stress concept and its calculation, capillarity and seepage in soils, flow nets, flow through the earth dams, Boussinesq's concept of stresses in soil, basic concepts of consolidation and compaction of soils, shear strength of soil, stability of slopes, concept of earth pressure and its evaluation, soil exploration principles and methods of site investigation, bearing capacity of soils and its evaluation, shallow foundations, settlement analysis of shallow foundations, types of piles and load carrying capacity of piles, types of caissons and their installation techniques, scour depth and grip length of caissons.

Other Topics in Civil Engineering:
Surveying: principles of surveying, types of surveying, basic principles and concepts of chain, compass, plane table and theodolite surveying, principles of leveling, principles of tacheometry surveying and trigonometric leveling, method of setting out simple curves.

Building Materials & Construction: basic properties and tests of stones, bricks, lime, cement, concrete and wood, Flemish bond, English bond, lintels, roofs, stair case, damp proof, form work, introduction to CPM and PERT.