MAHATRANSCO Surveyor Exam Syllabus (Civil)

1. Fluid Mechanics and Machinery :

Properties of fluids, pressure measurement fluid statics, buoyancy and flotation, fluid kinematics and fluid dynamics, orifices and mouthpieces, notches and weirs, laminar and turbulent flows, flow through pipes, forces on immersed bodies, flow in open channels, impact of jets, Hydraulic turbines and pumps, dams, power houses, hydrology and hydro power plants.

2. Strength of materials and theory of structures :

Simple stresses and strains, Hooke's Law, elastic constants, stress strain curve of mild steel stresses on oblique planes . Principal stresses and strains, Mohr's stress circle, temperature stresses, compound bars, shear force and bending moment diagrams for beams, bending and shear stresses in beams, strain energy principles, torsion of circular shafts . Pure torsion and combined with bending and thrust, deflections of simple beams, thin and thick cylinders, columns and struts, direct and bending stresses, trusses, propped cantilevers and fixed beams, arches, cables and suspension bridges; moving loads and influence lines; static and kinematic indeterminacies, Continuous beams and portal frames movement distribution, Kani's and matrix methods. Unsymmetrical Bending and shear Centre.

3. Geo-Technical Engineering :

Origin and classification of soils, three phase system, basic definitions and relations, effective stress. Permeability, capillarity and seepage of soils, flow nets, flow through earthen dams, compressibility, consolidation and compaction of soils, shear strength, stability of slopes, earth pressures and retaining walls, stress distribution in soils, settlement analysis, subsurface exploration and site investigations, bearing capacity of soils, shallow and deep foundations, pile foundations.

4. Steel structure:

Riveted and welded joints, Connections . eccentric and framed, simple and compound beams, tension and compression members, plate and gantry girders, roof trusses, plate girder and truss bridges, water tanks, roof trusses, tubular sections and design, transmission towers, column bases, plastic analysis, basic principles, theorems, methods of analysis, analysis and design of determinate and indeterminate beams and frames.

5. Reinforced Concrete:

Materials. Properties, grades and tests, workability and mix design of concrete. Basic concepts of working stress and limit state methods of design . Limit state design of beams, slabs, columns, footings. Circular and flat slabs, water tanks, bridges. IRC specifications and loadings, Slabs and T- beam bridges, retaining walls, Pre-stressed concrete. basic concepts, losses and analysis and design of beams including end block.

6. Other Topics:

Elements of surveying . Chain, plane table, compass and theodolite, leveling, building materials and construction, formwork, CPM and PERT.