



ITian's Academy Pune
Par Excellence
Path of Success for Civil & Mechanical Engineering MPSC, GATE & IES

Syllabus

Mains Paper I

Sr. No.	Topics
Section A	
1	Strength of materials Stresses, strains, principal stresses, bending moments, shear forces and torsion theory, bending theory of beam, deflection of beam, theories of buckling of columns.
2	Theory of structures Analysis of beams, frames and trusses, slope deflection method, moment distribution method.
3	Computer aided analysis and design of structures Computer-aided analysis and design of structures, application of computer programming to structures. numerical methods such as: i. Finding area by Simpson's rule, trapezoidal rule; ii. Finding root of an equation by a) Newton-Raphson techniques b) Bisection method iii. Solution of simultaneous equations by a) Gauss elimination method, b) Gauss Jordan method, c) Iteration method.



Sr. No.	Topics
Section B	
4	Structural analysis Analysis of arches and suspension cables, influence lines, stiffness and flexibility matrix methods.
5	Steel Structures Plastic Analysis, Design of bolted and welded connections, columns, footings, trusses, steel beams, plate girders.
6	Construction Planning and management Functions of management, Elements of material management, safety engineering, network analysis, construction equipment, site layout, quality control, agreement, PPP investment models, EPC, various acts related to workers and industry (workmen compensation act, factories act, minimum wages act, etc.)
Section C	
7	Design of Reinforced concrete Structures (WSM and Limit State) Design of slab, beams, columns, footing.
8	Design of Reinforced concrete Structures (WSM and Limit State) Retaining walls, tanks, building frames, staircases.
9	Bridge Engineering Selection of site, types of bridges, discharge, waterway, spans, afflux, scour, standards, specifications, loads and forces, erection of superstructure, strengthening cofferdams, caissons.





Sr. No.	Topics
Section D	
10	Concrete Technology Properties of wet and hardened concrete, test on concrete, factors affecting concrete, water cement ratio, aggregate cement ratio, mix design, additives, design of form work, types of formwork.
11	Prestressed concrete Principles of pre-stressing, materials used and their properties, permissible stresses as per I.S. codes, systems of pre-stressing, losses in pre-stress, design of pretensioned and post-tensioned beams- simply supported, rectangular and T- beams, cable profile, end block design, bridge girder.
12	Geotechnical Engineering Geotechnical properties, stresses in soil, shear resistance, compaction, consolidation and earth pressure, stability of slopes, bearing capacity, settlements, shallow and deep foundations, basic engineering geology.

