



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

Syllabus

Mains Paper II

Sr. No.

Topics

Section A

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| 1 | Surveying
Classification of surveys, measurement of distances-direct and indirect methods, optical and electronic devices, prismatic compass, local attraction; plane table surveying, levelling, volume calculation, contours, theodolite, theodolite traversing, omitted measurements, trigonometric levelling, tacheometry, curves, photogrammetry, geodetic surveying, hydrographic surveying, advanced instruments in surveying. |
| 2 | Engineering Materials
Properties of wet and hardened concrete, tests on concrete, factors affecting strength of concrete, water-cement ratio, aggregate-cement ratio, mix design, additives, design of form work, types of form work, bitumen, mastic asphalt, emulsion, cutback, stone matrix asphalt, fly ash, sustainable building materials, stones, bricks, cement, lime, mortar, timber, plastic, concrete, steel, paints and varnishes. |
| 3 | Building Planning and Construction
Principles of building planning and design, integrated approach, building byelaws, building services such as vertical transportation, water supply sanitation, thermal ventilation, lighting, acoustics, fire protection, electrical fittings. Types of foundations, stones, brick and block masonry, steel and reinforced cement concrete structures, floors, doors and windows, roofs, finishing works, water proofing. |



Sr. No.	Topics
Section B	
4	Fluid mechanics Properties of fluids, fluid statics and buoyancy, kinematics and dynamics, flow measurement, flow in open channel, flow in closed conduits, dimensional and model analysis, losses in pipe flow, cavitations and separation, siphon, water hammer, boundary layer and control, pipe network.
5	Fluid machines Hydraulic turbines, centrifugal pumps, reciprocating pumps, power house, classification and layout.
6	Irrigation Engineering Water requirement of crops, methods of irrigation, lift irrigation, water logging, dams, spillways, energy dissipation, diversion head works, canal and canal structures, cross drainage works, river training works, lake tapping.
Section C	
7	Highway Engineering Planning of highway systems, alignment and geometric design, horizontal and vertical curves, grade separation, cross sectional elements of highway, thin and ultra thin white topping, overlays, rigid and flexible pavement, traffic engineering.





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Sr. No.	Topics
8	Tunnel Engineering Surveys, criteria for selection of size and shapes, driving in soft and hard grounds, mucking, dust control, ventilation, lighting and drainage, special methods of tunnelling, cut and cover method, TBM, NATM, tunnel lining, Irrigation and highway tunnelling, metro tunnelling.
9	Estimating, costing and valuation Specification, estimation, costing, tenders and contracts, rate analysis, valuation, arbitration.
Section D	
10	Engineering hydrology Hydrological cycle, precipitation, evaporation, infiltration, runoff, hydrographs, reservoir planning & sediment control, floods, flood routing, ground water.
11	Environmental engineering / Water supply Engineering Sources of supply, design of intakes, estimation of demand, water quality standards, primary and secondary treatment, maintenance of treatment units, conveyance and distribution of treated water, rural water supply.
12	Wastewater Engineering and Pollution Control Quantity, collection and conveyance and quality, disposal, design of sewer and sewerage systems, pumping, characteristics of sewage and its treatment, rural sanitation, sources and effects of air and noise pollution, monitoring, standards.
13	Solid waste management Sources, classification, collection and disposal.