

महाराष्ट्र अभियांत्रिकी सेवा (स्थापत्य), गट-'अ' व गट-'ब' (मुख्य) परीक्षा  
Maharashtra Engineering Services (Civil), Gr. A & Gr. B (Main) Exam

परीक्षेचे टप्पे :- लेखी परीक्षा - ४०० गुण,

मुलाखत - ५० गुण.

-: परीक्षा योजना :-

विषय	संकेतांक	माध्यम	दर्जा	प्रश्नसंख्या व गुण	कालावधी	प्रश्नपत्रिकेचे स्वरूप
स्थापत्य अभियांत्रिकी पेपर क्र. १	०१८	इंग्रजी	बी.ई. (सिव्हिल)	१००/२००	दोन तास	वस्तुनिष्ठ बहुपर्यायी
स्थापत्य अभियांत्रिकी पेपर क्र. २	०१९	इंग्रजी	बी.ई. (सिव्हिल)	१००/२००	दोन तास	वस्तुनिष्ठ बहुपर्यायी

-: अभ्यासक्रम :-

Civil Engineering, Paper - I

Sr. No.	Topics
1.	<b>Building Construction &amp; Materials:</b> 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 formwork. Stones, bricks, cements, lime, mortar, timber, plastic, concrete, steel, paints and varnishes. 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. Foundations, stones, brick and block masonry, steel and reinforced cement concrete structures, floors, doors and windows, roofs, finishing works, water proofing.
2.	<b>Strength of materials:</b> Stresses, strains, principal stresses, bending moments, shear forces and torsion theory, bending theory of beam, deflection of beam, theories of buckling of columns.
3.	<b>Theory of structures:</b> Analysis of beams, frames and trusses, slope deflection method, moment distribution method.
4.	<b>Structural analysis:</b> Analysis of arches and suspension cables, influence lines, stiffness and flexibility matrix methods.

5	<b>Steel structures:</b> Design of bolted and welded connections, columns, footings, trusses, steel beams, plate girders.
6	<b>Design of reinforced concrete structures (Working stress and limit state):</b> Design of slab, beams, columns, footing, retaining walls, tanks, building frames, staircases.
7	<b>Pre-stressed Concrete:</b> 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 pre-tensioned and post-tensioned beams- simply supported, rectangular and T- beams, cable profile, end block design, bridge girder.
8	<b>Construction Planning and Management:</b> Elements of scientific management, elements of material management, safety engineering, network analysis, construction equipment, site layout, quality control.
9	Computer-aided analysis and design of structures, application of computer programming to structures. numerical methods such as- <ul style="list-style-type: none"> <li>i. Finding area by Simpson's rule, trapezoidal rule;</li> <li>ii. Finding root of an equation by a) Newton-Raphson techniques</li> <li>iii. b) Bisection method</li> <li>iv. Solution of simultaneous equations by a) Gauss elimination method, b) Gauss-Jordan method, c) Iteration method.</li> </ul>

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## Civil Engineering, Paper –II

Sr. No.	Topics
1	<b>Surveying:</b> Classification of surveys, measurement of distances-direct and indirect methods, optical and electronic devices, prismatic compass, local attraction; plane table surveying, levelling, calculations of volumes, contours, theodolite, theodolite traversing, omitted measurements, trigonometric levelling, tacheometry, curves, photogrammetry, geodetic surveying, hydrographic surveying.
2	<b>Estimating, Costing and Valuation:</b> Specification, estimation, costing, tenders and contracts, rate analysis, valuation
3	<b>Geo-technical Engineering:</b> Geotechnical properties, stresses in soil, shear resistance, compaction, consolidation and earth pressure, stability of slopes, bearing capacity, settlements, shallow and deep foundations, cofferdams, ground water control.
4	<b>Fluid Mechanics:</b> 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, siphon, water hammer, boundary layer and control, pipe network.
5	<b>Fluid Machines:</b> Hydraulic turbines, centrifugal pumps, reciprocating pumps, power house, classification and layout.

6	<b>Engineering Hydrology:</b> Hydrological cycle, precipitation, evaporation, infiltration, runoff, hydrographs, reservoir planning & sediment control, floods, flood routing, ground water.
7	<b>Irrigation Engineering:</b> 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.
8	<b>Highway Engineering:</b> Planning of highway systems, alignment and geometric design, horizontal and vertical curves, grade separation, materials and different surfaces and maintenance, rigid and flexible pavement, traffic engineering.
9	<b>Bridge Engineering:</b> Selection of site, types of bridges, discharge, waterway, spans, afflux, scour, standards, specifications, loads and forces, erection of superstructure, strengthening.
10	<b>Tunnelling:</b> Open cuts, 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.
11	<b>Environmental Engineering</b>
a.	<b>Water Supply Engineering:</b> 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.
b.	<b>Waste Water Engineering &amp; Pollution control:</b> 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
c.	<b>Solid Waste Management:</b> Sources, classification, collection and disposal.

दिनांक – १५/४/२०१७

अवर सचिव  
महाराष्ट्र लोकसेवा आयोग