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MPSC

MAHARASHTRA ENGINEERING SERVICES

GROUP A & B (MAINS) EXAMINATIONS

2027
Revised & Updated as per Latest Syllabus

CIVIL ENGINEERING

Previous Years **Conventional** Questions with Solutions (Subject wise)

(Exams held between 2023 - 2026)

Useful for Various State Engineering Services Examinations

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Foreword

Dear Students,



Success in competitive examinations requires more than just knowledge of the subjects; it demands a clear understanding of the examination pattern, thorough conceptual preparation and the ability to apply knowledge effectively. Previous years' question papers play a vital role in achieving these objectives, as they help aspirants understand the nature of questions, identify important topics and assess the depth of preparation required.

The Maharashtra Engineering Services Examination conducted by the Maharashtra Public Service Commission (MPSC) has undergone significant changes in its examination pattern and syllabus. In particular, the Mains Examination has moved towards a conventional/descriptive pattern, comprising two papers for Civil Engineering. This change places greater emphasis on fundamental concepts, analytical thinking, numerical problem-solving, engineering applications and structured presentation of answers.

The revised syllabus encompasses a comprehensive range of Civil Engineering subjects, covering structural engineering, construction management, geotechnical engineering, surveying, building materials, fluid mechanics, irrigation, transportation, estimation, hydrology and environmental engineering. Aspirants must therefore adopt a systematic preparation strategy that integrates conceptual learning with regular numerical practice and descriptive answer writing.

Recognising the changing requirements of the examination, ACE Engineering Publications presents this subject-wise compilation of previous years' questions and solutions to support aspirants in their preparation. The systematic arrangement of questions enables students to assess the importance of individual subjects, understand recurring concepts and strengthen their fundamentals. The solutions are intended to facilitate better understanding and provide a valuable reference for effective examination preparation.

We believe that this book will serve as a useful resource for Civil Engineering aspirants preparing for the MPSC Maharashtra Engineering Services Examination, as well as other State Engineering Services.

At ACE, we continuously strive to support students through quality academic resources and systematic guidance. We welcome valuable suggestions and feedback from students and faculty members to improve the quality of our future publications.

We sincerely appreciate the efforts of all professors and subject experts who contributed to the preparation of this book.

With best wishes to all aspirants for their success!

Y.V. Gopala Krishna Murthy,
M Tech. MIE,
Chairman & Managing Director,
ACE Engineering Academy,
ACE Engineering Publications,
Frost Interactive Service Pvt. Ltd. (ACE ONLINE).

EXAM PATTERN

Maharashtra Civil Services Gazetted
Combine Prelims Examination

S. No.	Paper No.	Marks	Exam Duration	Nature of Question Paper
1	Paper I (Compulsory)	200	2 Hrs.	Objective Type
2	Paper II (Qualifying)	200	2 Hrs.	Objective Type

Maharashtra Engineering Services (Civil)
Group A & B (Main) Examination

Subjects	Paper No.	Marks	Standard Level	Medium	Exam Duration	Nature of Question Paper
Civil Engineering	Paper I	200	B.E. (Civil)	English	3 Hrs.	Conventional / Descriptive
	Paper II	200	B.E. (Civil)	English	3 Hrs.	Conventional / Descriptive

Note: The interview will be conducted for those who qualify in the main examination and it carries 50 Marks.

SYLLABUS

PAPER - I

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.

Theory of structures: Analysis of beams, frames and trusses, slope deflection method, moment distribution method.

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.

Structural analysis: Analysis of arches and suspension cables, influence lines, stiffness and flexibility matrix methods.

Steel Structures: Plastic Analysis, Design of bolted and welded connections, columns, footings, trusses, steel beams, plate girders.

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.)

Design of Reinforced concrete Structures (WSM and Limit State): Design of slab, beams, columns, footing, Retaining walls, tanks, building frames, staircases.

Bridge Engineering: Selection of site, types of bridges, discharge, waterway, spans, afflux, scour, standards, specifications, loads and forces, erection of superstructure, strengthening cofferdams, caissons.

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.

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.

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.

PAPER - II

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.

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.

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.

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.
Fluid machines: Hydraulic turbines, centrifugal pumps, reciprocating pumps, power house, classification and layout.

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.

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.
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.

Estimating, costing and valuation: Specification, estimation, costing, tenders and contracts, rate analysis, valuation, arbitration.

Engineering hydrology: Hydrological cycle, precipitation, evaporation, infiltration, runoff, hydrographs, reservoir planning & sediment control, floods, flood routing, ground water.

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.
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.
Solid waste management : Sources, classification, collection and disposal.

Weightage of Subjects in MPSC Mains (Conventional) Examination (2023 – 2025)

S.No.	Name of the Subject	2023	2024	2025
Paper-I				
01	Strength of Materials	39	39	31
02	Structural Analysis	71	79	79
03	Computer Aided Analysis	18	10	18
04	Steel structures	15	0	15
05	Construction Planning & Management	33	33	33
06	Reinforced Concrete Structure & Prestressed concrete	120	120	89
07	Bridge Engineering	23	30	23
08	Geotechnical Engineering	41	33	33
Paper-II				
09	Surveying	41	41	41
10	Engineering Materials	15	-	54
11	Building Planning & Construction	33	74	33
12	Fluid Mechanics	23	23	8
13	Fluid Machines	23	23	38
14	Irrigation Engineering	33	33	33
15	Transportation Engineering	56	63.5	56
16	Estimation, Costing & Valuation	33	28.5	33
17	Engineering Hydrology	33	35	33
18	Environmental Engineering	54	39	54
Total No. of Marks		**704**	**704**	**704**

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