

**“महाराष्ट्र नगरपरिषदा, नगरपंचायती व औद्योगिक नगरे राज्यसेवा परीक्षा - २०२३  
करीताचा अभ्यासक्रम ”**

**१. नगरपरिषद अभियांत्रिकी सेवा - स्थापत्य**

प्रश्नपत्रिकांची संख्या:- दोन (पेपर -१ व पेपर - २ एकत्रित)

विषय		प्रश्न संख्या	गुण	दर्जा	माध्यम	कालावधी	प्रश्नपत्रिकेचे स्वरूप
पेपर - १	मराठी	१५	३०	बारावी	मराठी	७० मिनिटे	वस्तुनिष्ठ बहुपर्यायी
	इंग्रजी	१५	३०	बारावी	इंग्रजी		
	सामान्य ज्ञान	१५	३०	पदवी	मराठी व इंग्रजी		
	बौद्धिक चाचणी	१५	३०	पदवी	मराठी व इंग्रजी		
एकूण		६०	१२०				
पेपर - २	विषयांशी संबंधीत घटक	४०	८०	पदवी	इंग्रजी	५० मिनिटे	वस्तुनिष्ठ बहुपर्यायी
एकूण		४०	८०			१२०	
एकूण = पेपर १ + पेपर २		१००	२००			मिनिटे	

**नकारात्मक गुणदान -**

१)	प्रत्येक चुकीच्या उत्तराकरिता २५% किंवा १/४ एवढे गुण एकूण गुणांमधून वजा / कमी करण्यात येतील.
२)	वरीलप्रमाणे कार्यपद्धतीचा अवलंब करताना एकूण अंतिम गुणांची बेरीज अपूर्णाकात आली तरीही ती अपूर्णाकातच राहिल व पुढील कार्यवाही त्याच्या आधारे करण्यात येईल.
३)	एखाद्या प्रश्नाचे उत्तर अनुत्तरित असेल तर, अशा प्रकरणी नकारात्मक गुणांची पध्दत लागू असणार नाही.

**-: अभ्यासक्रम :-**

संवर्गाचे नाव :- महाराष्ट्र नगरपरिषद अभियांत्रिकी सेवा - स्थापत्य	
पेपर - १	
अ. क्र	विषय
१.	मराठी: सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि <b>Marathi</b> : सर्वसामान्य शब्दसंग्रह, वाक्यरचना, व्याकरण, म्हणी व वाक्यप्रचार यांचा अर्थ आणि

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पेपर - १		
अ. क्र	विषय	
	उपयोग तसेच उतान्यावरील प्रश्नांची उत्तरे	उपयोग तसेच उतान्यावरील प्रश्नांची उत्तरे
२.	इंग्रजी: Common Vocabulary, Sentence Structure, Grammar, letter and e-mail writing Use of Idioms and phrases & their meaning and comprehension of passage.	<b>2 English:</b> Common Vocabulary, Sentence Structure, Grammar, letter and e-mail writing Use of Idioms and phrases & their meaning and comprehension of passage.
३	सामान्य ज्ञान	<b>General Studies</b>
३.१	भारताचा विशेषतः महाराष्ट्राचा इतिहास	<ul style="list-style-type: none"> <li>Indian History with special reference to Maharashtra</li> </ul>
३.२	भारताचा विशेषतः महाराष्ट्राचा भूगोल	<ul style="list-style-type: none"> <li>Indian Geography with special reference to Maharashtra</li> </ul>
३P.३	भारतीय अर्थव्यवस्था विशेषतः महाराष्ट्र <ul style="list-style-type: none"> <li>भारतीय आयात निर्यात</li> <li>राष्ट्रीय विकासात सरकारी, सहकारी ग्रामीण बँकांची भूमिका</li> <li>शासकीय अर्थव्यवस्था - अर्थसंकल्प लेखा, लेखापरीक्षण इत्यादी किंमती वाढण्याची/चलन वाढ कारणे व उपाय</li> </ul>	<ul style="list-style-type: none"> <li>Indian Economy with special reference to Maharashtra</li> <li>Indian Imports – Exports</li> <li>Role of Nationalise/Commercial, Co-operative, Rural banks in Indian Economy national development</li> <li>Government Economy, Sources and application of funds - Budgets Accounts and Audit etc</li> <li>Inflation – reasons and measures</li> </ul>
३.४	भारतीय राज्य व्यवस्था :- <ul style="list-style-type: none"> <li>भारताच्या घटनेचा प्राथमिक अभ्यास,</li> <li>संसद व राज्य विधान मंडळ इ.</li> <li>राज्य व्यवस्थापन (प्रशासन)</li> <li>ग्रामीण व शहरी प्रशासन</li> </ul>	<ul style="list-style-type: none"> <li>Indian Political System :-</li> <li>Indian Polity &amp; Constitution</li> <li>Parliament, state assembly etc.</li> <li>State administration</li> <li>Rural and Urban administration</li> </ul>
३.५	चालू घडामोडी- जागतिक व भारतासंबंधी	Current Affairs related to India and World,
३.६	पर्यावरण:- <ul style="list-style-type: none"> <li>मानवी विकास व पर्यावरण,</li> <li>पर्यावरण पुरक विकास,</li> <li>नैसर्गिक साधनसंपत्तीचे संधारण विशेषतः वनसंधारण</li> <li>विविध प्रकारची प्रदुषणे व पर्यावरणीय आपत्ती</li> </ul>	<ul style="list-style-type: none"> <li>Environment:-</li> <li>Human development and environment,</li> <li>Environment friendly / Sustainable development</li> <li>Conservation of natural resources specially forest conservation</li> <li>Types of pollutions and environmental disasters</li> <li>Institutions engaged in environmental conseversation at State, National and International Level</li> </ul>

संवर्गचे नाव :- महाराष्ट्र नगरपरिषद अभियांत्रिकी सेवा - स्थापत्य	
पेपर - १	
अ. क्र	विषय
	<ul style="list-style-type: none"> <li>पर्यावरण संवर्धनात कार्यरत असलेल्या राज्य / जागतिक / राष्ट्र / संस्था / पातळीवरील संघटना</li> </ul>
४	<p><b>बुद्धीमापन चाचणी</b> - उमेदवार किती लवकर व अचूकपणे विचार करू शकतो हे आजमावण्यासाठी प्रश्न</p> <p><b>अंकगणित</b> - बेरीज, वजाबाकी, गुणाकार, भागाकार, दशांश, अपूर्णाक व टक्केवारी, इ.</p> <p><b>General Mental Ability :</b> Questions will check how fast and accurate a candidate can think.</p> <p><b>Numerical Ability:</b> Summation, Subtraction, Multiplication, Division, Decimals, Fractions, Percentage, etc.</p>

पेपर २	
विषयाशी संबंधित घटक (अभियांत्रिकी सेवा - स्थापत्य)	
Sr. No.	Topics
1.	<p><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.</p>
1.1	<p><b>Engineering Mechanics</b></p> <p>System of Coplanar Forces – Resultant of concurrent forces, parallel forces &amp; Non concurrent Non parallel system of forces. Moment of force about a point, Couples, Varignon's theorem, Distributed forces in plane, Centroid and Centre of Gravity, Moment of Inertia &amp; its theorem.</p> <p>Condition of equilibrium for concurrent forces, Parallel forces and Non concurrent Non parallel general system of forces &amp; couples. Types of supports, loads, beams. Analysis of trusses.</p> <p>Laws of friction, Cone of friction, Equilibrium of bodies on inclined plane. Application of problems involving wedges, ladders, Screw friction.</p> <p>Kinematics of particle: - Velocity and acceleration in terms of rectangular coordinate system, Rectilinear motion, Motion along plane curved path, Tangential and Normal components of acceleration. Motion Curves (a-t, v-t, s-t curves), Projectile motion. Relative motion. Newton's second law of Motion, principle of work &amp; energy,</p>

	D'Alemberts principles, equation of dynamic equilibrium. Moment of Energy principles: Linear momentum, principle of conservation of momentum, Impact of solid bodies, direct and oblique impact, impact of solid bodies, semi elastic impact and plastic impact.
1.2	<b>Construction Planning and Management:</b> Elements of scientific management, elements of material management, safety engineering, network analysis, construction equipment, site layout, quality control.
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>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.
8.	Computer-aided analysis and design of structures, application of computer programming to structures. numerical methods
9.	<b>Estimating, Costing and Valuation:</b> Specification, estimation, costing, tenders and contracts, rate analysis, valuation
10.	<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.
11	<b>Fluid Machines:</b> Hydraulic turbines, centrifugal pumps, reciprocating pumps, <b>power</b> house, classification and layout.
12	<b>Engineering Hydrology:</b> Hydrological cycle, precipitation, evaporation, infiltration, runoff, hydrographs, reservoir planning & sediment control, floods, flood routing, ground water.
13	<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.

14	<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.
15	<b>Bridge Engineering:</b> Selection of site, types of bridges, discharge, waterway, spans, afflux, scour, standards, specifications, loads and forces, erection of superstructure, strengthening.
16	<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, Environment protection Act
c.	<b>Solid Waste Management:</b> Sources, classification, collection and disposal.
17	<b>Applied Mathematics –</b>
a)	<b>Matrices –</b> Types of Matrices (Symmetric, Skew-symmetric, Hermitian, Skew Hermitian, Unitary, Orthogonal Matrices, properties of Matrices) Rank of a Matrix using Echelon forms, reduction to normal form, PAQ in normal form, system of homogeneous and non-homogeneous equations. Linear dependent and independent vectors.
(b)	<b>Partial Differentiation-</b> Partial Differentiation; Partial derivatives of first and higher order. Total differentials, differentiation of composite and implicit functions. Euler's theorem on homogeneous functions with two and three independent variables. Deductions from Euler's Theorem
(c)	Linear Differential Equations with Constant Coefficients and Variable Coefficients of Higher Order – Linear Differential Equation with constant coefficients – complementary function, particular integrals of differential equation, Cauchy's homogeneous linear differential equation and Legendre's differential equation, Method of variation of parameters.
(d)	Differentiation under Integral sign, Numerical Integration - Differentiation under Integral sign with constant limits of integration, Numerical Integration by (a) Trapezoidal (b) Simpson's 1/3 <sup>rd</sup> (c) Simpson's 3/8 <sup>th</sup> rule.
(e)	Double Integration – Change the order of integration, Evaluation of double integrals by changing the order of integration and changing to polar form.
(f)	Triple Integration and Application of Multiple Integrals – Application of double Integrals to compute Area, Mass, Volume. Application of triple integral to compute volume.