

**पोलीस उप अधीक्षक/ सहायक पोलीस आयुक्त (मोटार परिवहन),  
सामान्य राज्य पोलीस सेवा, गट-अ, गृह विभाग  
Deputy Superintendent of Police/ Assistant Commissioner of Police  
(Motor Transport), General State Police Services, Gr.-A.**

परीक्षेचे टप्पे: लेखी परीक्षा - २०० गुण,

मुलाखत-५० गुण

प्रश्न संख्या : १००.

विषय	संकेतांक	माध्यम	कालावधी	दर्जा	प्रश्नपत्रिकेचे स्वरूप
सामान्य अध्ययन	९००	इंग्रजी	एक तास	पदवी	वस्तुनिष्ठ बहुपर्यायी
बुद्धिमापन चाचणी		इंग्रजी			
मोटार वाहन विभागाशी संबंधित कायदे व नियम व इतर कायदे		इंग्रजी		बी.ई. यांत्रिकी व स्वयंचल अभियांत्रिकी	
यांत्रिकी व स्वयंचल अभियांत्रिकी		इंग्रजी			

अंतीम गुणवत्ता यादी ही वस्तुनिष्ठ परीक्षेतील व मुलाखतीतील एकत्रित गुणांवर आधारीत राहिल.

**-: अभ्यासक्रम :-**

सामान्य अध्ययन, बुद्धिमापन चाचणी, मोटार वाहन विभागाशी संबंधित कायदे व नियम व इतर कायदे व यंत्र व स्वयंचल अभियांत्रिकी विषयक घटक या विषयामध्ये खालील घटक व उपघटकांचा समावेश असेल.

क्रमांक	घटक व उपघटक
1.	<b>सामान्य अध्ययन :-</b>
अ	विज्ञान व अभियांत्रिकी
१	वैज्ञानिक विचारसरणी व दृष्टीकोन - विज्ञानाचे स्वरूप, विज्ञानाची पूर्वगृहितके, शास्त्रीय पध्दती, वैज्ञानिक ज्ञान
२	आधुनिकीकरण व विज्ञान - आधुनिकीकरण म्हणजे काय, आधुनिकीकरणाचे प्रकार, आधुनिकीकरण व भारत (समस्या व उपाय)
३	जागतिक तसेच भारतातील वैज्ञानिक व अभियांत्रिकी प्रगती.
४	वैज्ञानिक प्रगतीमुळे शहरी तसेच ग्रामीण जीवनावर झालेला परिणाम.
५	भारतीय समस्यांवर वैज्ञानिक उपाय, उदा. ऊर्जा समस्या, अन्नधान्य समस्या, लोकसंख्या समस्या, पर्यावरण समस्या, शैक्षणिक समस्या, गृहनिर्माण समस्या, परिवहन समस्या, संपर्क विषयक समस्या, लोकस्वास्थ्य, इत्यादी.

	<b>ब</b>	<b>जागतिक तसेच भारतातील चालू घडामोडी :-</b>
		राजकीय, औद्योगिक, आर्थिक, सामाजिक, शैक्षणिक, भौगोलिक, खगोलशास्त्रीय, सांस्कृतिक.
	<b>क</b>	<b>वाणिज्य व अर्थ व्यवस्था :-</b>
	१.	भारतीय आयात-निर्यात
	२.	राष्ट्रीय विकासात सरकारी, सहकारी, ग्रामीण बँकांची भूमिका.
	३.	शासकीय अर्थव्यवस्था – अर्थसंकल्प, लेखा, लेखा परीक्षण, इत्यादी.
	४.	पंचवार्षिक योजना
2.		<b>बुद्धिमापन चाचणी विषयक प्रश्न :-</b> उमेदवार किती लवकर व अचूकपणे विचार करू शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.
3.		<b>मोटर वाहन विभागाशी संबंधित कायदे व नियम व इतर कायदे</b>
	1.	Motor Vehicles Act-1988
	2.	Central Motor Vehicles Rules -1989
	3.	Maharashtra Motor Vehicles Rules - 1989
	4.	Factories Act.
	5.	Ability to handle a fleet of Government Vehicles and launches and to train staff.
4.		<b><i>MECHANICAL and AUTOMOBILE ENGINEERING</i></b>
	1	<b>Engineering Mechanics:</b> Equivalent force systems, free body concepts, equations of equilibrium, trusses and frames, Kinematics and dynamics of particles and rigid bodies, impulse and momentum (linear and angular), Potential and kinetic energy and principles of conservation of kinetic energy and momentum
	2	<b>Strength of Materials:</b> Stress and Strain, stress-strain relationship and elastic constants, shear force and bending moment diagrams, Bending & Shear Stresses, deflection of Beams, Torsion of circular shafts, thin and thick cylinders.
	3	<b>Theory of Machines and Machine Dynamics:</b> Planar cams and followers, gear tooth profiles, governors and flywheels, balancing of reciprocating and rotating masses. Free and forced vibration of single degree freedom systems, effect of damping vibration isolation, resonance, critical speed of rotors.
	4	<b>Design of Machine Elements:</b> Design for static and dynamic loading, failure theories; fatigue, Design of bolted and welded joints, design of simple machine elements like shafts and keys, spur gears, brakes and clutches, belt drives, selection of rolling and sliding contact bearings.
	5	<b>Heat Transfer:</b> Modes of heat transfer; one dimensional heat conduction, thermal resistance, contact resistance, heat flow through composite plane walls. Natural and forced convection, non-dimensional numbers, radiative heat transfer, black and grey surfaces, shape factors.
	6	<b>Thermodynamics :</b> Zeroth, First and Second laws of thermodynamics; thermodynamic system and processes; irreversibility and availability; behaviour of ideal and real gases, properties of pure substances, calculation of work and heat in ideal processes; analysis of thermo -dynamic cycles related to energy conversion – Carnot, Otto and Diesel cycles.
	7	<b>Automobile Engines:</b> I.C. Engines and its classification, Air Standard Cycles, Fuel air cycles, Actual cycles, Requirements and suitability of fuels in IC engines, fuel ratings, fuel-air mixture requirements, Alternative fuels, Comparison of four stroke and two stroke engine, Firing order and its significance.

8	<b>S.I. &amp; C.I. Engine Fuel System:</b> Carburetor and its working principle. Requirements of an automotive carburetor; Starting, idling, acceleration, circuits of carburetors, mechanical and electrical pumps, fuel feed system, petrol injection strategies- M.P.F.I and port fuelling techniques, diesel injection system- requirements, function of components, jerk and distributor type pumps, fuel injector- type of injection nozzle, spray characteristic, injection.
9	<b>Fuel Combustion in I.C. Engines:</b> Magneto and battery ignition systems for S.I engines; ignition timing, combustion of diesel- ignition quality. Cetane number, Stoichometric, equation of combustion of diesel fuel
10	<b>Combustion in S.I. Engines:</b> Stages of combustion, flame propagation, rate of pressure rise, abnormal combustion: phenomena of knocking, effect of engine variables on knock.
11	<b>Combustion Chambers:</b> Combustion Chambers – different types, factor controlling combustion chamber design.
12	<b>Combustion in C.I. Engines:</b> Stages, heat release and ignition delay correlations. Abnormal combustion, factors affecting abnormal combustion. Knock in C.I. engines- comparison of knock in C.I. & S. I. engines.
13	<b>Fuel Air Mixing:</b> Importance of air motion – swirl, squish and turbulence- swirl ratio, period, factors affecting delay period.
14	<b>Super Charging And Turbo Charging:</b> Necessity and Limitation, charge cooling, type of Super Charging And Turbo Charging, relative merits, matching of turbo charger.
15	<b>Engine Cooling System:</b> Need for cooling system. Types of cooling system, liquid and air cool systems. Thermo siphon and pressurized cooling system. Properties of coolants.
16	<b>Lubrication System:</b> Lubrication System, Mist lubrication System, Wet sump and dry sump lubrication, forced feed lubrication system. Scavenging – Scavenging Methods, Scavenging pumps,
17	<b>Engine Testing:</b> Performance test 2-stroke and 4-stroke engine, IHP, BHP Mechanical efficiency, brake thermal efficiency. Performance curve i.e. load v/s efficiency, speed v/s efficiency
18	<b>Elements of Automobile Engineering:</b> Automobile vehicle specifications, classifications, chassis layout, frame, main components of automobile and articulated vehicles. Engine-Cylinder arrangements, power requirements, motion resistance and power loss; tractive effort and vehicle performance characteristics.
19	<b>Automobile Chassis :</b> Vehicles Chassis and Frames, Suspension systems and springs, Transmission systems, Steering systems, Braking Systems, Inspection and testing of motor vehicles, Trouble shootings of automobile engines, Pollution control norms of automotive vehicles.
20	<b>Vehicle Testing and Maintenance:</b> Need of vehicle testing, vehicle test standards, different vehicle tests, Maintenance – trouble shooting and service procedure – overhauling – engine turn up, tools and equipment for repair and overhaul – organization and management of service station – testing equipment. Pollution due to vehicles emissions and its exhaust emission control system and regulation. Selection of power unit and engine performance, characteristic trouble shooting and rectification, engine tuning and servicing.

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दिनांक : २२/०३/२०१८

सचिव  
महाराष्ट्र लोकसेवा आयोग.