

पोलीस उप अधीक्षक / सहायक पोलीस आयुक्त (मोटर परिवहन), गट- अ या पदाची चाळणी परीक्षायोजना व अभ्यासक्रम :-

दर्जा:- पदवी

वेळ:- दोन तास

प्रश्नपत्रिकेचे स्वरूप - वस्तुनिष्ठ

माध्यम:- इंग्रजी

एकूण गुण:- २००

घटक	तपशीलवार अभ्यासक्रम	गुण
1. सामान्य अध्ययन	<p><b>I) विज्ञान व अभियांत्रिकी :-</b></p> <ol style="list-style-type: none"> <li>वैज्ञानिक विचारसरणी व दृष्टिकोन - विज्ञानाचे स्वरूप, विज्ञानाची पूर्वगृहितके, शास्त्रीय पध्दती, वैज्ञानिक ज्ञान.</li> <li>आधुनिकीकरण व विज्ञान -आधुनिकीकरण म्हणजे काय, आधुनिकीकरणाचे प्रकार, आधुनिकीकरण व भारत (समस्या व उपाय)</li> <li>जागतिक तसेच भारतातील वैज्ञानिक व अभियांत्रिकी प्रगती.</li> <li>वैज्ञानिक प्रगतीमुळे शहरी तसेच ग्रामीण जीवनावर झालेला परिणाम.</li> <li>भारतीय समस्यांवर वैज्ञानिक उपाय, उदा.ऊर्जा समस्या, अन्नधान्य समस्या, लोकसंख्या समस्या,पर्यावरण समस्या, शैक्षणिक समस्या, गृहनिर्माण समस्या,परिवहन समस्या,संपर्क विषयक समस्या,लोकस्वास्थ्य, इत्यादी.</li> </ol> <p><b>II) वाणिज्य व अर्थव्यवस्था :-</b></p> <ol 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.</li> <li>पंचवार्षिक योजना</li> <li>किंमती वाढण्याचे कारणे व उपाय.</li> </ol> <p><b>III) जागतिक तसेच भारतातील चालू घडामोडी :-</b></p> <p>राजकीय,औद्योगिक, आर्थिक, सामाजिक,शैक्षणिक,भौगोलिक,खगोलशास्त्रीय,सांस्कृतिक,वैज्ञानिक, इत्यादी.</p>	50
2. बुद्धिमत्ता चाचणी	उमेदवार किती लवकर व अचूकपणे विचार करू शकतो याचा अंदाज घेण्याच्या दृष्टीने सदर प्रश्न विचारण्यात येतील.	50
3. मोटर परिवहन विभागाशी संबंधित कायदे व नियम व इतर कायदे	<p>I. Motor Vehicles Act - 1988</p> <p>II. Central Motor Vehicles Rules 1989</p> <p>III. Maharashtra Motor Vehicles Rules 1989</p> <p>IV. Factories Act.</p> <p>V. Ability to handle a fleet of Government Vehicles and launches and to train staff.</p>	25
4. Mechanical Engineering and Automobile Engineering	<p><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</p> <p><b>Strength of Materials:</b> Stress and strain, stress -strain relationship and elastic constants, shear force and bending moment diagrams, bending and shear stresses, deflection of beams, torsion of circular shafts, thin and thick cylinders</p> <p><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.</p> <p><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 contact bearings</p>	

**Heat-Transfer:** 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

**Thermodynamics:** Zeroth, First and Second laws of thermodynamics, Thermodynamic systems 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 thermodynamic cycles related to energy conversion - Carnot, Otto, and Diesel, cycles

**Automobile Engines - I.C. Engine 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.

**SI and CI Engine Fuel System:** 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-types of injection nozzle, Spray characteristics, injection.

**Fuel combustion in I C Engines:** 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

**Combustion in SI engines:** Stages of combustion, flame propagation, rate of pressure rise. abnormal combustion: Phenomena of knocking. Effect of engine variables on knock.

**Combustion Chambers:** Combustion chambers- Different types, Factor controlling combustion chamber design.

**Combustion in CI Engines:** Stages, heat release and ignition delay correlations. Abnormal combustion, factors affecting abnormal combustion. Knock in CI engines-comparison of knock in CI & SI engines

**Fuel air mixing:** Importance of air motion-swirl, squish and turbulence-swirl ratio. period, factors affecting delay period.

**Supercharging and Turbo Charging:** Necessity and limitation, Charge cooling, Type of supercharging and turbo charging, Relative merits, matching of turbocharger

**Engine Cooling System:** Need for cooling system. Types of cooling system, Liquid and air cooled systems. Thermo siphon and pressurized cooling system. Properties of coolants.

**Lubrication System:** Lubrication system, Mist lubrication system, Wet sump and dry sump lubrication, Forced feed lubrication system. Scavenging - Scavenging methods Scavenging pumps, Scavenging pumps.

**Engine Testing:** Performance test of 2-stroke and 4- stroke engine. I.H.P, B.H.P Mechanical efficiency, Brake thermal efficiency. Performance curve i.e. Load v.s. efficiency, Speed v.s. efficiency etc.

**Elements of Automobile Engg - 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

	<p><b>Automobile Chassis:</b> Vehicles Chassis and Frames, suspension systems and springs, Transmission systems, Steering systems, Braking systems, wheels and tyres, Automobile air conditioning, engine servicing, Inspection and testing of motor vehicles, Trouble shootings of automobile engines, Pollution control norms of automotive vehicles.</p> <p><b>Vehicle Testing and Maintenance:</b> Need of vehicle testing, vehicle tests standards, different vehicle tests. Maintenance – trouble shooting and service procedure – over hauling –engine tune up, tools and equipment for repair and overhaul – organization and management of service station – testing equipments. Pollution due to vehicle emissions and exhaust emissions control systems and regulations. Selection of power unit and engine performance characteristics troubleshooting and rectification, engine tuning and servicing.</p>	
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टिप :- पोलीस उप अधिक्षक / सहायक पोलीस आयुक्त (मोटार परिवहन), गट- अ या पदाच्या चाळणी परीक्षेची तारीख निश्चित झाल्यानंतर ती आयोगाच्या [www. mpsc.gov.in](http://www.mpsc.gov.in) या वेबसाईटवर व वृत्तपत्रात बातमी म्हणून प्रसिद्ध करण्यात येईल. तसेच चाळणी परीक्षेच्या प्रवेशपत्राद्वारे संबंधित उमेदवारांना कळविण्यात येईल.