

હેડ કોન્સ્ટેબલ ડ્રાઇવર મિકેનિક (ગ્રેડ-૧) સંવર્ગની સ્પર્ધાત્મક પરીક્ષાનો વિગતવાર અભ્યાસક્રમ

**Scheme of Examination**

Total Marks – (210)          Duration – (3 Hours)          Total MCQs-(210)

The Written Examination shall consist of Part A and Part B as follows:

**PART-A : (90 marks)**

1. 90 Mark; 90 MCQs
2. 40 % Minimum qualifying standard
3. Negative marking 0.25
4. 0 (Zero) marks for “E” option

ક્રમ	વિષય	ગુણ
૧	તાર્કિક કસોટી (Reasoning), Data Interpretation	30
૨	ગાણિતિક કસોટી (Quantitative Aptitude)	30
૩	બંધારણ, વર્તમાન પ્રવાહો, અંગ્રેજી અને ગુજરાતી કોમ્પ્રિહેન્શન (Constitution of India, Current affairs, English and Gujarati Comprehension)	30
<b>કુલ ગુણ</b>		<b>90</b>

**PART-B : (120 Marks)**

1. 120 Mark; 120 MCQs
2. 40 % Minimum qualifying standard
3. Negative marking 0.25
4. 0 (Zero) marks for “E” option

Sr.No.	Subject	Marks
1	<b>ENGINEERING DRAWING:</b> Engineering Curves, orthographic and isometric projections, fasteners – Projection of points, Lines & Planes, Limits Fits and Tolerances.	<b>120</b>
2	<b>ENGINEERING MECHANICS:</b> Centroid & Centre of gravity, coplanar concurrent forces, Coplanar parallel and non- concurrent forces Friction, Rectilinear motion, curvilinear motion- centripetal force, Work-Power-Energy, Simple machines.	
3	<b>THEORY OF MACHINES AND MACHINE DESIGN:</b> General consideration in Machine Design, Fundamental units, Derived units, Stress & Strain, Bearing Stress, Torsional & Bending stress, power transmission, flywheel and Governor, Frictional clutches and Brakes, Gears and Bearings, Balancing and Vibration.	
4	<b>NON-CONVENTIONAL ENERGY SOURCES:</b> Renewable sources of Energy such as Hydro, Solar, Wind, Bio mass, Tidal and Geo Thermal Energy.	

5	<p><b>THERMODYNAMICS AND THERMAL ENGINEERING:</b>  Basic concepts of Thermodynamics –first and second law of thermodynamics – thermodynamic cycles, fluid statics, kinematics and dynamics. Flow measurements, orifice and pipes, impact of jet, working of pumps, modes of heat transfer, fundamentals of refrigeration and air conditioning.</p>	
6	<p><b>INTERNAL COMBUSTION ENGINES:</b>  I C engines – part and their functions, I C engines – types and classification, types of fuels used in I C engines and their properties, Working of Petrol and Diesel engines, fuel injection systems – for Petrol, Diesel, LPG and CNG, MPFI, Cooling &amp; lubricating system of IC engine, Combustion Process, performance test on IC engine, Eco friendly fuels-conventional, LPG, CNG, Bio fuel and other topics related to Internal Combustion Engines.</p>	
7	<p><b>MATERIALS AND MANUFACTURING ENGINEERING:</b>  Engineering Materials, Heat treatment processes, Metal working, metal casting and metal joining processes, basic machine tools.  Conventional manufacturing processes like Turning, Welding, Shaping, Molding, Foundry Technology, Drilling etc.</p>	
8	<p><b>AUTOMOBILE ENGINEERING:</b>  Anatomy of vehicles, Automobile Systems - Necessity of clutch, Types of clutch, Constructional and functional details of clutch, Necessity of Transmission, Types of Transmission system, and other topics related to Automobile Transmission &amp; Mechanism. Brake and suspension systems, control systems, conventional steering and power steering, Electrical systems- for starting, ignition and lighting, Vehicle Body Engineering, repairs and maintenance of automobiles. Automobile Component Design, Vehicle Kinematics &amp; Dynamics, Modern Vehicle Technology, Automobile Manufacturing technology.</p>	
9	<p><b>COMPUTER AIDED DESIGN AND COMPUTER AIDED MANUFACTURING (CAD/CAM):</b>  CAD work station, Graphic packages-types and features, Geometric modeling, Various CAD software's, Introduction to CNC machines-constructional features and working. Automatic tool changer (ATC) and Automatic pallet changer (APC). CNC Part Programming.</p>	
10	<p><b>POLLUTION AND VEHICLE INSURANCE:</b>  Exhaust gasses emission control systems. CNG conversion, Vehicle noise and its control. National and International standard norms for exhaust gas pollution control. PUC Certification. Licensing, Regulations of motor vehicles, Motor vehicle insurance</p>	
11	<p><b>DIAGNOSIS AND TESTING OF VEHICLE:</b>  Testing of various elements of the vehicle Systems-Battery, clutch, brakes, wheels and tyres (wheel alignment, wheel balancing), etc. Performance test.</p>	