

**SYLLABUS OF WRITTEN TEST FOR THE POST OF ASSISTANT INSPECTOR OF MOTOR VEHICLES, CLASS-3, ADVT. NO.9/12-13 FOR THE SUBJECT OF AUTOMOBILE ENGINEERING.**

Total Questions: 300 Total Marks: 200 Duration:155 Minutes

Medium: English

**1.ENGINEERING DRAWING:**

Engineering curves,orthographic and isometric projections,fasteners.

**2.ENGINEERING MECHANICS:**

Coplanar and concurrent forces .Centre of gravity,Friction,Work-Power-Energy,Simple machines.

**3.NON CONVENTIONAL ENERGY SOURCES:**

Renewable sources of energy such as Hydro,Solar,Wind,Biomass,Tidal and Geothermal energy,energy conversion and auditing.

**4.THEORY OF MACHINES AND STRENGTH OF MATERIALS:**

Power transmission,Fly wheel,Governor,Cam and cam profile. Direct stress and strain. Shear forces and bending moment.

**5.BASIC THERMODYNAMICS AND HYDROLICS:**

Basic cocepts of thermodynamics-first and second law of thermodynamics.Thermodynamic cycles.Flow measurement.Working of centrifugal pump and reciprocating pumps.

**6.MATERIALS AND MANUFACTURING TECHNOLOGY:**

Metal working,metal casting and metal joining process.Engineering materials.Heat treatment processes.

**7.AUTOMOBILE ENGINES:**

Principles of I C engines,constuctional and functional details of I C engines. Combustion process of IC engines.

**8.AUTO TRANSMISSION AND MECHANISM:**

Clutch,Gear box, Steering mechanism.Suspension system.Rear axle assembly.

**9.AUTO ELECTRICAL SYSTEM AND AUTOTRONICS:**

Automobile battery.Ignition system.Charging system.Current and voltage regulation of alternator.PLC.Transducers,Sensors,Actuators and their applications in automobile.

**10.FUELS AND LUBRICANTS:**

Properties of Fuels, fuel additives, combustion and anti knock rating of fuels, Alternative fuels for IC engines, Lubricants-properties of lubricants, gradation of lubricating oil, fluid friction and theory of lubrication.

### **11. BASIC AUTOMOBILE DESIGN:**

Types of stresses. General design considerations. Design of-piston, connecting rod, crank shaft, gear box.

### **12. TRANSPORT MANAGEMENT AND MOTOR INDUSTRY:**

Transport authorities, Licencing, Regulations of motor vehicles, Motor vehicle insurance, Control of traffic.

### **13. VEHICLE BODY ENGINEERING AND DYNAMICS:**

Miscellaneous body service. Minor and major body repairs. Vehicle-Balancing, Vibrations and performance.

### **14. DIAGNOSIS AND TESTING OF AUTOMOBILES:**

Testing of various elements of the automobile systems-Battery, clutch, brakes, wheels and tyres (wheel alignment, wheel balancing), etc. Performance test.

### **15. VEHICLE AIR CONDITIONING:**

Fundamentals of vehicle air conditioning. Servicing of vehicle air conditioning and Heating systems.

### **16. AUTOMOBILE POLLUTION CONTROL ENGINEERING:**

Exhaust gasses emission control systems. CNG conversion, Automobile noise and its control. National and International standard norms for exhaust gas pollution control. PUC certification.

**Syllabus of Written Test for the post of Assistant Inspector of Motor Vehicles, class-3, Advt. No. 9/12-13 for the subject of Mechanical Engineering.**

Total Questions: 300 Total Marks: 200 Duration:155 Minutes

Medium: English

**1.ENGINEERING DRAWING AND MECHANICAL DRAFTING :**

Engg. Curves, orthographic and isometric projections, fasteners – Projections and Sections of Solids, development of surfaces, Limits Fits and Tolerances.

**2.ENGINEERING MECHANICS AND STRENGTH OF MATERIALS :**

Center of Gravity, Friction, Work-Power-Energy, Simple machines. Direct stress and strain, Stresses in beams, Deflections of beams, torsion and springs, riveted and welded connections, Combined direct and bending stresses.

**3.NON CONVENTIONAL ENERGY SOURCES :**

Renewable sources of Energy such as Hydro, Solar, Wind, Bio mass, Tidal and Geo Thermal Energy, energy conversion and auditing.

**4.FLUID MECHANICS AND HYDROULIC MACHINES :**

Properties of Fluid, Fluid Kinematics and dynamics, flow measurement, flow through pipes, Centrifugal, reciprocating and submersible pumps, hydraulic devices like – Hydraulic press, Hydraulic crane and accumulator.

**5.THERMODYNAMICS AND THERMAL ENGINEERING :**

Basic concepts of Thermodynamics –first and second law of thermodynamics – thermodynamic cycles, boilers, steam prime movers, condensers, I C engines – part and their functions, working of two stroke and four stroke engines, performance test on I C engine, fuels-conventional, LPG, CNG, turbines, modes of heat transfer, fundamentals of refrigeration and air conditioning.

**6.MANUFACTURING ENGINEERING:**

Metal working, metal casting and metal joining processes, basic machine tools, kinematics of machines, metal removal processes, cutting tools- their materials- tool life. Presses and press tools.

**7.ADVANCE MANUFACTURING SYSTEMS :**

Fundamentals of cellular manufacturing, flexible manufacturing system, concept of concurrent engineering, just in time manufacturing. Computer integrated manufacturing.

**8.METROLOGY AND INSTRUMENTATION :**

Linear and angular measurement, testing of – Flatness, Squareness, roundness, various types of limit gauges, pressure- flow and temperature measurement, calibration of instruments.

### **9.MATERIALS TECHNOLOGY :**

Properties of engineering materials, ferrous metals and their alloys, non ferrous metals and their alloys, powder metallurgy on destructive testing.

### **10.THEORY OF MACHINES AND MACHINE DESIGN :**

Velocity and acceleration diagrams, cam and cam profiles, friction – friction in pivot and Collar bearings- friction clutches and brakes, fly wheel and governor, balancing and Vibration. Design of machine elements subjected to direct, bending and twisting loads, Design of pressure vessels, Design of journal bearings, selection of anti-friction bearings.

### **11.AUTOMOBILE ENGINEERING :**

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, transmission and suspension systems, conventional steering and power steering, Electrical systems- for starting, ignition and lighting, repairs and maintenance of automobiles, Emission standards, PUC certification.

### **12.TOOL ENGINEERING/ TOOL DESIGN :**

Process planning , estimation of time and cost for various tool components . Introduction to tool design, Tool types-classification , features and applications. Tool materials- types/Classification , composition. Cutting tool selection. Jigs and Fixtures. Design of press tools. Design of limit Gauges.

### **13.COMPUTER AIDED DESIGN AND COMPUTER AIDED MANUFACTURING (CAD/CAM) :**

CAD work station, Graphic packages-types and features, Geometric modeling, Various CAD softwares, Introduction to CNC machines- constructional features and working. Automatic tool changer(ATC) and Automatic pallet changer(APC). CNC Part Programming.

### **14.INDUSTIAL ENGINEERING AND MANAGEMENT :**

Techniques of work study-method study and work measurement. Quality assurance. Statistical quality control – acceptance sampling. Ergonomics Materials management- Inventory control. Production planning and control (PPC) . PERT and CPM. Value Analysis and value Engineering.

**SYLLABUS OF WRITTEN TEST FOR THE POST OF ASSISTANT INSPECTOR OF MOTOR VEHICLES, CLASS-3, ADVT. NO.9/12-13 FOR THE SUBJECT OF GUJARATI (PAPER-2).**

Total Questions: 50 Total Marks: 50 Duration: 25 Minutes

1. ગદ્યાર્થગ્રહણ (Comprehension)
2. કહેવતો (Proverbs)
3. રૂઢિપ્રયોગો (Idioms)
4. સમાનાર્થી શબ્દો (synonyms)
5. વિરુદ્ધાર્થી શબ્દો (Opposite words/Antonyms)
6. જોડણી (Spelling)
7. અલંકાર (Figure of speech)
8. સમાસ
9. શબ્દસમૂહો માટે સામાસિક કે પારિભાષિક શબ્દો
10. સંધિ
11. છંદ