

## **AUTOMOBILE ENGINEERING DIPLOMA STANDARD**

1. ENGINEERING MECHANICS Friction and Transmission of motion - Mechanical properties of materials - Simple Stress and strain - Revits - Revited joints, Shear, force, Twist, Theory of simple bending deflection.

### 2. MATERIAL SCIENCE

Structure of metals - Ferrous alloys Non ferrous metals and alloys - Heat Treatment of steel and surface heat treatment or case hardening - Toughening - Normalising - refining. Fluid mechanics : Properties of fluids - flow of fluids - Flow of fluids in closed conduits - Reciprocating pumps - Cantrifugal pump - Hydraulic systems.

### 3. PRODUCTION TECHNOLOGY

Patterns - Foundry - Casting Technics Welding - Drilling - boring and Jig boring machines - Milling machines - Grinding machine - Cylinder Boring and boring machines. Lathes - Gas welding - Arc welding Brazing and soldering.

4. ELECTRICAL AND ELECTRONIC ENGINEERING Units and symbols - AC and DC - Electro magnetisms - EMF - DC Circuits - Battery types Dry, Wet - DC Generators - DC Motors and Sarters - Transistor - Capacitor - Diodes - Rectifiers - circuit breakers, Electronic components - symbols.

### 5. HEAT POWER ENGINEERING

Properties of Gases - Expansion of Gases - Air cycles - Fuels - Lubricants Viscosity, Flashpoint, Pour point - Engines Value timing, - port timing - Air compressors performance - IC Engine performance.

6. AUTOMOBILE TECHNOLOGY(PETROL ENGINES) Principles of 2 stroke and 4 stroke engines - Valve arrangements - Engine blocks - cylinder heads - Wet and dry liner - Pistons - connecting rod - Crank shaft - Comshaft - timing gears - valve/ports - Firing order - Static balance - Dynamic balance - cooling systems - Radiators - Lubricating system - Lubricating oil characteristics Crank case ventilation - Engine testing/Fault finding, equipments - Carburation and Carburettors - Emissions Control system in Petrol engines (Pollution control). Battery lead acid - types - capacity - coil ignition system - Magnete ignition system and transistorised ignition system - ignition timing - spark plugs - starter motors - Alternators - voltage and current regulator - cutout unit. Flasher unit - wiring looms - circuits lighting - Auto cable - symbols - Tyres - tubes - Types and maintenance.

### 7. DIESEL ENGINES

Diesel Engine for Automobile purpose - Combustion process of Diesel engines - Diesel knock - Diesel Fuel characteristics - Cetane number - combustion chamber types - Direct and Indirect injection types of combustion chambers - Injectors types - Feed pumps - Emission control in Diesel engines - Fuel Injection Pumps - Phasing and Calibration - Governors' - Super charges and Turbo Chargers - Maintenance and servicing.

### 8. TRANSMISSION AND CONTROLS

Clutches - Gearboxes - Epicyclic gear box - Pre selector gear box - universl joints - Differential - Floating axles. Constant velocity joints - suspension system - independent front suspension systems - steering types - caster - camber - toe in - towout - wheel balancing - brakes - Testing its efficiency - Trouble shooting - Carage and service Station Preventive Maintenance and servicing.

9. INDUSTRIAL MANAGEMENT AND ROAD TRANSPORT Organisation - Leadership - Morale - Motivation - Methods study and work measurement - concept of time study. Production planning and control - Personnel - Materials - machines - Manpower Tool requirements. Factory act - Industrial legislation - Welfare - Safety - Financial Management. Goods Transport, Passenger transport, Layout operation, Layout garages - Bus stand - Classification - passenger transport organisaition and Administrative set up. Motor Vehicle act - Road signals - Traffic signals - Permit - Registering vehicle - Fitness certificate

- Ticket system. Study to improve services, Accident claim. Market research - costing in Road transport Running cost.

10. BODY BUILDING TECHNOLOGY Terminology - classification of motor vehicle body - passenger transport - goods Transport - Cars - Chassis - frame principle - Aerodynamic body considerations. Body shape - Noise elimination - Statutory obligations of visibility - Space - Seating - body shape designs. Bus body construction. Goods vehicle construction - Tanker, Tipper Constructions - Ergonomics of Driver seat design - Painting - Body repairing - maintenance and safety on painting.

COMPUTER PROGRAMMING Generation of Computers - Classifications - Memory unit - Low level high level language - object of Program - Basic - Expression - relative and logical operators - Graphics - use of Lotus - Data base management.