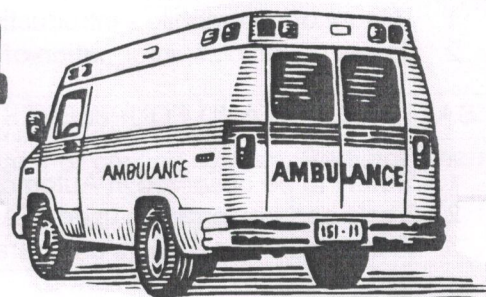
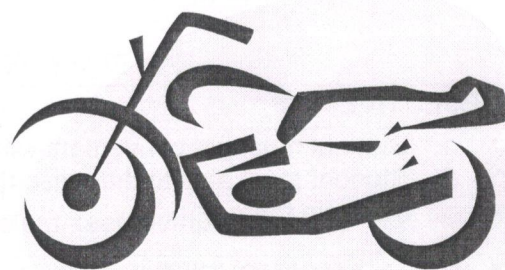
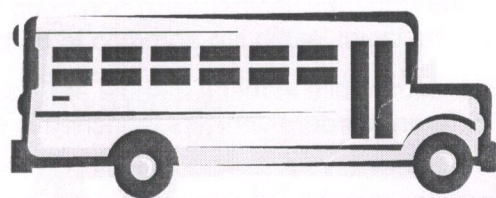


# AUTOMOBILE FACULTY

COURSES & SYLLABII



INDIAN TECHNICAL EDUCATION SOCIETY, MUMBAI

Implemented From Nov. -2014



INDIAN TECHNICAL EDUCATION SOCIETY, MUMBAI

CERTIFICATE COURSE

AUTOMOBILE MECHANIC (ATM)

EXAM SCHEME:	THEORY PAPER	100 MARKS – 3 HRS.
	PRACTICAL	100 MARKS – 2 HRS.

[ATM]

THEORY SYLLABUS

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**OBJECTIVE**

1. Student must get conversant with repair of Automobile parts like Engine, gear box etc.
2. Student must able to diagnose the vehicle defect and repair the same as well as to maintain them.

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**1. INDIAN AUTOMOBILE INDUSTRY**

1. History of automobile - Introduction, automobile industry in India and its growth.
2. Types of vehicles, information of different modern vehicles launched in India.

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**2. SAFTY, TOOLS AND EQUIPMENTS**

1. Safety to be observed in Automobile workshop.
2. Tools and equipment's used in Automobile workshop.
3. Proper handling of tools and garage equipments, fuels, oils greases and other chemicals used in automobile workshop

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**3. ENGINE (POWER SYSTEM)**

1. General information about internal combustion engines.
2. Types and working of I. C. Engine.
3. Main Principal of Internal Combustion engine.
4. Definition of cylinder Bore, Stroke, Compression Ratio, Horse power.
5. Auto engine fundamentals and main parts of engine i.e. crank shaft, camshaft, flywheel, Piston, crank case, engine head etc.
6. Single and multi cylinder engine. Tappet Adjustment and decarburizing engine overhaul, firing order.

**PETROL ENGINE (S. I. ENGINE)**

1. Principle and operation of petrol engine.
2. Four stroke petrol engine. (S. I. Engine)
3. Two stroke petrol engine. (S. I. Engine)
4. Maintenance of petrol engine and possible faults.



**DIESEL ENGINE (C. I. ENGINE)** Principle of Diesel engine and operation.

1. Four stroke Diesel engine. (C. I. Engine)
2. Maintenance of Diesel engine and possible fault
3. Advantages of diesel engine.
4. Difference between Petrol (S. I. Engine) and Diesel (C. I. Engine) engines.

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#### **4. PETROL FUEL FEED SYSTEM**

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1. Function and Types of Petrol fuel feed system.
2. Construction and working of pump feed system, carburetor, different circuits of Solex carburetor, fuel filter, fuel tank, fuel gauge etc.
3. Introduction and study of Multi point fuel injection system (MPFI) used for modern petrol engine
4. Trouble shooting and remedies of petrol fuel feed system.

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#### **5. DIESEL FUEL FEED SYSTEM**

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1. Types and function of diesel fuel supply system
2. Construction and working of diesel fuel feed system, feed pump, F. I. pump, fuel filter, fuel injector, governor (mechanical, vacuum) etc.
3. Introduction of common rail diesel injection system (CRDI) used on modern vehicles.

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#### **6. ENGINE COOLING SYSTEM**

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1. Function of cooling system and its different types.
2. Construction and working of pump circulating water cooling system.
3. Construction & working principles of various parts of cooling system, Radiator Thermostat, water pump, coolant, radiator pressure cap etc.
4. Trouble shooting and remedies and maintenance of cooling system.

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#### **7. LUBRICATION SYSTEM**

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1. Function of lubrication system, types, working of lubrication system and its parts
2. Study if different possible faults and remedies occurred in pressure lubrication system.

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#### **8. STEERING SYSTEM**

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1. Necessity of steering system, construction, working of steering system.
2. Types of steering gear box used in manual steering system
3. Study of hydraulic operated and electric operated power steering.
4. Steering Geometry, Angles i.e. camber, caster, Toe-in, Toe-out, Ackerman's principle etc.
5. Trouble shooting and possible faults, procedure of wheel Alignment and Wheel Balancing.

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#### **9. SUSPENSION SYSTEM**

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1. Necessity of suspension system and Types of suspension system
2. Construction and working of different parts of suspension system, different types of spring used in suspension system.
3. Construction and functions of different types of axles.
4. Faults of suspension system and their remedies.



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## 10. TRANSMISSION SYSTEM

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1. Function of transmission system and various parts of transmission system.
2. Clutch – Principle, working operation, Types and free play adjustments, maintenance. Function of single plate and diaphragm clutch. Introduction of fluid fly wheel.
3. Gear box – Principle and working function, Construction, types of gear box and types of selector mechanism. Construction and working of synchromesh gear box, Introduction of automatic transmission used on modern vehicle
4. Propeller shaft –. Function of propeller shaft, Construction, working, types of universal joints slip joint etc
5. Construction and working of Final drive.
6. Rear Axle and Differential – Principle, Construction, working of differential and its type and construction of rear axle and its maintenance differential teeth adjustment (backlash) etc.

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## 11. BRAKE SYSTEM – INTRODUCTION TO DISC BRAKES

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1. Necessity, function and types of brake system.
2. Construction, working of hydraulic brake and Hand brake and used on vehicles.
3. Hydraulic Brake Principle, Construction and working of master cylinder, wheel cylinder and other parts of hydraulic brake system, procedure of brake bleeding and other faults and remedies of brake system
4. Introduction and study of vacuum and air assisted hydraulic brake system and air brake system.
5. Working, construction and function of Disc brake.

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## 12. WHEEL, TYRE & CHASSIS

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1. Types of wheel, different specification and parts of wheel.
2. Different procedures of tyre maintenance.
3. Chassis – types, construction, lubrication etc.
4. Chassis alignment and maintenance.

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## 13. AUTOMOBILE ELECTRICITY

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1. Study of different electric circuits used on modern vehicle, dashboard electrical gauges etc.
2. Ignition system – construction, working, function of ignition circuit and its parts, Study of testing different ignition system parts and its maintenance.
3. Battery – Working, construction, testing and maintenance of battery, charging circuit.
4. Construction & working of electric starter, its parts and maintenance.
5. Construction, working & function of Dynamo & Alternator their parts and maintenance.

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## 14. VEHICLE MAINTAINANCE

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1. Types of maintenance- Operative, preventive and brake down maintenance.



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## SCHEME OF EXAMINATION

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Theory on paper	3 Hours	100 Marks
Practical	2 Hours	75 Marks
Journal work		15 Marks
Oral		10 Marks
Total		200 Marks

Minimum marks for passing 35% Theory & 40% Practical

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## GUIDELINES FOR QUESTION PAPER SETTERS

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Q. no.1 Compulsory (Objective type). 20 marks

Q. no.2 to 8 Solve any five questions from Q. 2 to 8 (Subjective type). 16 marks each

The paper setter should take care that (as far as possible) entire syllabus is equally covered.

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INDIAN TECHNICAL EDUCATION SOCIETY, MUMBAI

CERTIFICATE COURSE

AUTOMOBILE TECHNICIAN (ATT)  
PAPER - I

[ATT - I / DATES - I]

THEORY SYLLABUS : AUTOMOBILE ENGINES

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### 1. SAFETY

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1. Safety precautions to be observed in Automobile workshop or Motor Garage.
2. Study of workshop layout and safety methods of material handling.

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### 2. TOOLS & EQUIPMENT

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1. Study of different Tools & Equipment's used in auto work shop.
2. Study of different measuring instruments used for automotive repairs.

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### 3. MOTOR VEHICLE INDUSTRY

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1. Study of Motor Vehicle manufacturing industry, different Motor vehicles manufactured in India, Different types of Motor vehicles in India.

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### 4. ENGINE

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1. General description of internal combustion Engines and External Combustion Engines.
2. Principle & function of internal Combustion Engine.

#### PETROL ENGINE (Spark Ignition engine)

1. Study of Two Stroke Cycle petrol engine.
2. Study of Four Stroke Cycle petrol engine.
3. Study of different parts of four stroke multi cylinder engine i.e. Engine head, block, crank case, gaskets, crank shaft, cam shaft valve and valve mechanism etc.
4. Single and Multi cylinder engine & Classification of Engine.
5. Definitions of - Bore, stroke, Cubic Capacity, Compression Ratio, Horse Power, Mechanical efficiency, Brake Thermal Efficiency, Indicated Thermal efficiency.
6. Tappets adjustment, Decarburizing process, Engine Tune-up, Automotive engine overhaul and their maintenance Trouble shooting charts.
7. Types of Two Wheelers and It's classifications. Function of Two stroke cycle incase of scooters and motor cycles.
8. Introduction of L.P.G. & C.N.G. fuel and its use in Engine.



## **DIESEL ENGINE (Compression Ignition Engine)**

1. Principle of Two stroke and Four stroke cycle diesel engines.
2. Working of four stroke cycle Diesel.
3. Difference in the construction and operation of four stroke and two stroke cycle engines.
4. Diesel engines and its parts, function, process of combustion, pre-ignition and detonation.
5. Diesel engines maintenance, Decarburizing, overhauling, parts, assembly inspection, trouble shooting.
6. Advantages and Disadvantages of four stroke and two stroke diesel engine.
7. Engine performance test.

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## **5. FUEL FEED SYSTEM & EXHAUSTS SYSTEM:**

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### **PETROL, LPG, CNG ENGINE FUEL SUPPLY SYSTEM**

1. Functions of fuel supply system, various parts in the Fuel system and their functions, operations and its maintenance. Study of different fuel such as LPG, CNG, used in today's vehicles, Super chargers.
2. Carbonization of petrol, Antiknock value and Octane rating, Fuel gauge, Construction.
3. Trouble shooting in case of petrol feed system and its rectification and maintenance vaporization.
4. Construction of fuel tanks for four / two wheelers maintenance.
5. Introduction to MPFI system & its layout different types of sensors & their working, Construction and working of MPFI system of 16 valve / 12 valve MPFI engine.
6. Introduction of CNG / LPG fuel supply system and its layout, Advantages & disadvantages of CNG / LPG over petrol engines, important parts of CNG, LPG fuel supply system and Maintenance of the same

### **DIESEL ENGINE FUEL SYSTEM**

1. Diesel Fuel supply and fuel direct and indirect injection system, Study of (CRDI) Common rail direct injection fuel supply system.
2. Fuel tank construction and maintenance, Working of Diesel fuel system, Components and their functions – fuel filters, injectors, and fuel Injection pumps,
3. Study of turbo charger, principle & function of Turbo charger. Details study of Inter cooler system used in turbo charged engine.
4. Injector testing. Bleeding air from fuel line or removing air lock.
5. Fuel feed pump and fuel injection pump tests. Functions, operation of fuel injection pump and its calibration and testing etc, Spill out off tests.
6. Types of Governors on fuel injection pumps, characteristics.
7. Diesel fuel system maintenance, trouble shooting.
8. Introduction to Bio Diesel Fuel System.



## EXHAUST SYSTEM

1. Constituents of petrol and diesel smoke.
2. Function and constructional features of silencer, muffler, Tailpipe etc.
3. Types of silencers, mufflers and repair / maintenance.
4. Silencer system on two wheelers.
5. Study of Catalytic converters, exhaust gas analyzers and smoke meters for Diesels.

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## 6. ENGINE COOLING SYSTEM

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1. Necessity of cooling the engine - types of cooling system & coolants, Working of Engine Air cooling system, Working of Engine Water Cooling system with construction of all parts incorporated in it. Principle & function of pressurized cap system
2. Working of Thermostat and its testing methods, Water pump construction, Radiator construction working of Temperature Gauge.
3. Cooling additives, Anti- Freeze solutions, Use of various coolants, Anti freezer.
4. Cooling system Troubles – Remedies and Maintenance.

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## 7. AIR INTAKE SYSTEM

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1. Type of air filters and its operations, maintenance.
2. Types of manifolds, its repairs / maintenance.
3. Advantages of divided manifolds.
4. Two wheelers Air intake systems.

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## 8. ENGINE LUBRICATION SYSTEM:

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1. Necessity of Lubrication, Types of Lubrication and Lubricants used on MVS.
2. Two stroke engine lubrication, Mist Lubrication, Splash and Pressure types.
3. Parts in engine lubrication system – Oil pump, Oil filters (full flow and bypass types), bypass and pressure relief valve, Oil pressure gauges, Pipelines Oil Seals etc, Crankcase ventilation.
4. Various types of lubrication systems for vehicle chassis, Types of Greases, Chassis Lubrication.
5. Chemistry of Lubricating oils, Oils additives.
6. Various types of bearings used on motor vehicles and their maintenance. 8. Trouble shooting and maintenance of lubrication system.

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## 9. AUTOMOTIVE ELECTRICITY:

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1. Necessity of Electrical system.
2. Working of Auto Electricity.
3. Various parts and units in Auto Electricity.
4. Construction operation and maintenance of storage battery, Dynamo, Alternator, Starter, Ignition system.
5. Working of regulator cut- out and solenoid switch.







INDIAN TECHNICAL EDUCATION SOCIETY, MUMBAI

AUTOMOBILE TECHNICIAN (ATT)

[ATT - II / DATES – II]

THEORY SYLL ABUS: AUTOMOBILE CONTROL SYSTEMS AND PRACTICE

100 Marks, 3 Hours

### 1. STEERING SYSTEM

1. Necessity of steering system, Parts in the steering system, Construction and working of various type of steering Gear system used on Indian Motor Vehicles, Steering System, employed on two / three wheelers.
2. Steering Geometry – Ackerman principle, caster angle, camber angle, Toe-in, Toe- out, Toe-out turns, slip angle, Wheel Alignment and its adjustment.
3. Construction & working of linkage type & integral type steering system, Power steering, Principle, Power steering type's hydraulic and electric power steering, Power steering operations and advantages.
4. Trouble shooting adjustment & maintenance of manual and power steering system.

### 2. SUSPENTION SYSTEM

1. Necessity of suspension system, Principle & Operation of air suspension.
2. Construction and working of various type of suspension system fitted on Indian motor Vehicles.
3. Conventional semi elliptic and Independent suspension Leaf, Coil, Parallel, Link, and Torsion bar, McPherson, Wishbone types etc.
4. Principles and operations of Air suspension and its advantages.
5. Necessity of shock absorbers and bushes, Suspension of two, three wheelers.
6. Stub axle or steering knuckle & front axle construction and types.
7. Trouble shooting, adjustment and maintenance of suspension system.

### 3. TRANSMISSION SYSTEM

1. Necessity of transmission system.
2. Layout of Automobile transmission system incorporating various units.
3. Various types of Auto power transmission, four wheel and front wheel drive. 4 wheel drive and front wheel drive, Rear wheel drive, Hotchkiss Drive & Torque Tube Drive.
4. Construction details of various transmission system units such as clutch, Gearbox, Propeller shaft, Universal joint their principle & working.
5. Principle & working operation of Final drive, Rear axle assembly, differential, components of final drive etc. gear ratios.
6. Adjustment of clutch play, free play.
7. Gear & clutch mechanism used on two, three and four wheelers.



## 8. CAR AIR CONDITIONING.

1. Introduction to car air-conditioning.
2. Lay out, construction & operation of air conditioner.
3. Maintenance of car air-conditioner.

## 9. MOTOR VEHICLE ACT – 1988 & VEHICLE INSURANCE

1. M. V. Act 1988, M. V. rules 1989, topic of chapter / section 8 schedules, definitions of chapters,
2. Licensing of drivers, Registration of M. Vs. control of Transport vehicles, State & interstate contractors,
3. Private & Public Vehicles, Traffic rules, offences & penalties, Speed limits, Signs in 8<sup>th</sup> 9<sup>th</sup> schedules.

## 10. M.V. Act 1988 with Amendments.

1. Insurance of motor vehicles, comprehensive & 3<sup>rd</sup> party insurance, procedure & limits.
2. Various papers to be carried with M. V.
3. Licensing procedures.
4. PUC of MVS Two Wheelers.
5. Bharat state I, II, III OR Euro I, II, III

## 11. GARAGE EQUIPMENTS AND LAYOUT

Layout of model, Equipments used for motor vehicles, greasing equipments spray painting and greasing machinery, Car servicing hoists, Car washing machines, Jib head crane / Electric hoists.

## GUIDELINES FOR QUESTION PAPER SETTERS

Q. no.1 Compulsory (Objective type). 20 marks

Q. no.2 to 8 Solve any five questions from Q. 2 to 8 (Subjective type). 16 marks each

The paper setter should take care that (as far as possible) entire syllabus is equally covered.

## SCHEME OF EXAMINATION :

Theory Two Paper	3 hours	100 Marks each
Practical	2 hours	75 Marks
Journal		15 Marks
Oral		10 Marks
		Total 300 Marks

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Effective from Nov. – 2014 onwards

Page No : 12



INDIAN TECHNICAL EDUCATION SOCIETY, MUMBAI

CERTIFICATE COURSE

AUTO ELECTRICIAN (ATE)  
[ATE / DATES – III]

THEORY SYLL AB US

**1. SAFETY:**

1. Study modern layout of auto electrician work shop
2. Safety precautions to be observed in auto electrical work shop.

**2. TOOLS, EQUIPMENTS, MEASURING INSTRUMENTS:**

1. General Hand tools, soldering materials and method of soldering,
2. Standard wire gauge, micrometer, ohm meter, Ampere meter, voltmeter, meggar, multi-meter, hydrometer, tong tester etc.
3. Growler, Armature Tester, Battery charger, spark plug tester etc.

**3. ELECTRICAL TECHNICAL TERMS AND BASIC ELECTRICITY:**

1. Conductor, Insulator, Resistance, current, potential difference, Power, energy,
2. Circuits and their types, ohm's law, fuse Terminal – their definitions and unit, Simple problems on ohm's law and power.

**4. MAGNETISM:**

1. Study of magnetic material, type and shapes of magnets and properties methods of magnetizing and magnet materials.
2. Study of electromagnet and its advantages. Principle of magnetism, cork screw and R. H. Thumb rule - magnetic field of current carrying conductor and loop Residual magnetism solenoid and it's polarity, palm rule etc.

**5. BATTRIES**

1. Types of batteries, working of lead acid Battery used on Automobile vehicle, Battery construction, Battery checking method – hydrometer and H.R.D. Battery charging method.
2. Distinguish between lead acid Battery and Alkaline Battery, effect on battery by under charging and overcharging, Trouble shooting of Battery.



## 6. DYNAMO AND REGULATOR

1. Study of Dynamo, working principle, Faraday's law of Electromagnetic Induction. Construction of Dynamo and its parts
2. Types of dynamo, Third brush dynamo, Regulator circuit, Dynamo working, checking procedure.
3. Types of regulator – its construction and working, Regulator setting procedure, Trouble shooting.

## 7. ALTERNATOR

1. Study of alternator, Principle of alternator, difference between alternator and dynamo.
2. Alternator construction – its parts making and checking procedure. Alternator working
3. Types of Regulator, Voltage Regulator. Alternator wiring and charging circuit diagram, Working of Battery Indicator light, Maintenance and trouble shooting of alternator.

## 8. ENGINE STARTER MOTOR

1. Study of starter motor, principle of starter motor. Types of starter motor by field and carbon brush.

In board drive mechanism and out board drive mechanism.

2. Types of starter motor – solenoid switch, starter, Motor test, Trouble shooting and maintenance.

## 9. IGNITION SYSTEM:

1. Function of Ignition system, Types of Ignition system. Battery ignition system, magneto ignition system and electronic ignition system
2. Parts of Ignition system – Ignition coil, Condenser distributor, advance mechanism. Spark plugs their construction and working. Types of spark plug – hot and cold plug Spark plug specification Trouble shooting and maintenance of Ignition system and spark plug, Electronic Ignition System.

## 10. AUTOMOBILE WIRING AND DASH BOARD INSTRUMENTS

1. Study of different vehicle dash boards, Earth Return system, Types of wire and wire terminal, wiring harness, precaution to be taken while wiring.
2. Automotive electrical bulbs, Types of switches, use of fuse, wire colour code system. Circuit diagram of head light, side Indicator light Tail light, Brake light, Reverse light etc.
3. Electric Horn and Horn, circuit. Wind screen wiper motor, electrical fuel pump. Heater plug, Fuel gauge, Temperature gauge, Sensors.



**11. POWER WINDOWS AND REMOTE LOCKING (AUTO COP.)**

1. Lay out of power windows, Installation & operation of power windows.
2. Electrical circuit diagram for power windows, Wiring diagram & operation.
3. Centre locking circuit diagram & operation.

**12. BODY CONSTRUCTION.**

- i) Types of bodies & their structure.
- ii) Panel work, denting work etc.
- iii) Various painting procedures like over coat & scrap down painting.

**SCHEME OF EXAMINATION**

Theory on paper	3 Hours	100 Marks
Practical	2 Hours	75 Marks
Journal work		15 Marks
Oral		10 Marks
Total		200 Marks

Minimum marks for passing 35% Theory & 40% Practical

**GUIDELINES FOR QUESTION PAPER SETTERS**

Q. no.1      Compulsory (Objective type).      20 marks

Q. no.2 to 8      Solve any five questions from Q. 2 to 8 (Subjective type).      16 marks each

The paper setter should take care that (as far as possible) entire syllabus is equally covered.

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INDIAN TECHNICAL EDUCATION SOCIETY, MUMBAI

CERTIFICATE COURSE

DIESEL MECHANIC (DM)

EXAM SCHEME:	THEORY PAPER	100 MARKS	- 3 HRS.
	PRACTICAL	100 MARKS	- 2 HRS.

THEORY SYLL ABUS

OBJECTIVE

1. Student must get conversant with repair of automobile parts like Engine, Gearbox etc.
1. Student must be able to dingoes the vehicle defect & Repair the same as well as to maintain them.

---

**1. SAFETY**

Safety precaution to be observed in workshop / motor garage, Tools and Equipment ,Hand Tools and equipment for performance measurement in Automobile Trade.

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**2. MOTER VEHICLE INDUSTRY**

Study of different motor vehicle manufacturers in India. Study of different latest vehicle manufactured in India.

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**3. ENGINE**

Study compression ignition internal combustion engine.

1. Principal of operation of four stroke diesel (C. I.) engines.
2. Material used for diesel engine parts, Engines various parts and their functions.
3. Process of combustion and detonation, Different designs of combustion chambers.
2. Diesel Engine: compression ratio, pickup, maintenance and repairs and overhauling decarburizing and Troubleshooting.
3. Use of gauges like vacuum gauge, compression gauge, Stroboscope and dynamometer test. Valve adjustment and valve timing diagram etc.
4. Definition of horse power, Mechanical efficiency, brake, horse power, cubic capacity etc.

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**4. FUEL FEED AND EXHAUST SYSTEM**

1. General layout of diesel fuel injection system.



2. Working of diesel fuel system parts like – fuel pump, fuel filters, fuel injection pumps types or governors and their working. Distributor type fuel injection pump working.
3. Hand priming pump, Fuel airlock removing, Injections and injectors testing. Fuel feed pump parts.
4. Phasing and calibration of fuel Injection pump, Replacing F. I. Pump from the Engine.
5. Fuel gauge, Diesel as a Fuel, octane number, Air cleaner.
6. Trouble shooting and maintenance of fuel Injection system, Manifold and silencer muffler.
7. Direct and indirect injection.

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## 5. ENGINE COOLING SYSTEM

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1. Study of different types of cooling system, Necessity of cooling
2. Study of Air cooling system, water cooling, it's types and then working, radiators construction, parts in water cooling system, thermostat, water pump fan belt, Temperature gauge, Radiator pressure cap, cooling system additives, Coolant used in cooling system troubles and maintenance.

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## 6. ENGINE LUBRICATION SYSTEM

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1. Study of different lubricating system used for engine, Necessity of lubrication.
2. Types of lubricants used in motor vehicle – Lubricant system & types of Lubrication system – Splash lubrication, force feed lubrication – Two stroke lubrication – Parts in engine lubrication system
3. Types & functions, oil fitters, by pass and pressure relief valve, oil, pump, Oil pressure gauge, Oil coolers, Heat exchangers.
4. Automobile lubricants types, liquid, semi solid and solid lubricants, S.A. E. Number, Viscosity, oil used, oil used in Engine, Gear box, differentials etc.
5. Additives, greases, chassis lubrication, various types of Bearing used in motor vehicles, lubrication system troubles and maintenance.

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## 7. AUTOMOBILE ELECTRICITY

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1. Necessity of electrical system, Working of Auto electricity – construction, operation and maintenance of lead acid battery, dynamo, Alternator, starter,
2. working of regulator cut-out of solenoid system, Dashboard instruments seen on instrument panel their working and maintenance, use of meter such as ohmmeter, voltmeter, multi-meter and it's use, H.R.D. tester, Battery charger etc. care & maintenance of auto electrical system,

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## 8. TRANSMISSION SYSTEM

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1. Requirement and function of transmission system, types of Transmission system.
2. Clutch: Principle, Construction & Operation of various types.
3. Gear box: Principle, Construction & Operation of various types.
4. Propeller shaft & universal Joints: Principal, Construction & Operation of various types.



5. Final drive: Principle, Construction & Operation.
6. Rear Axle & Differential: Principal, Construction & Operation of differential and rear axle.
7. Various adjustments in transmission system, troubleshooting & remedies in transmission system.

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## **9. BREAK SYSTEM**

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1. Necessity of breaks to motor vehicle, various types of brakes system & their construction & operation.
2. Types of brake system, hydraulic break system, Disc Break & Drum Breaks, Vacuum Breaks. Power breaks – Air pressure breaks, Maintenance of break system.

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## **10. STEERING SYSTEM**

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1. Necessity of steering system, Types of steering system, Power steering concept, hydraulic and electric power steering
2. Construction, operation & Maintenance of steering system.
3. Steering geometry & wheel alignment – possible faults rectification, steering system maintenance.

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## **11. SUSPENSION SYSTEM**

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- 1) Necessity of suspension.
- 2) Types of suspension system – its parts & functions.
- 3) Construction & function of stub Axle & front Axle.
- 4) Spring & shock absorbers.
- 5) Air suspension.
- 6) Faults & remedies in the suspension system.

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## **12. WHEELS, TYRES & CHASSIS**

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1. Types of wheels – parts of wheels, Types of tyres – Tyre construction & maintenance.
2. Concept of cross ply and radial ply, Tyres size, various types of tyre constructions.
3. Tyres rotation, Troubleshooting of tyres, suspension and steering system.

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## **13. MAINTENANCE**

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1. Types of vehicle maintenance such as operative, preventive and brake down maintenance.
2. Study of preventive maintenance scheduled of vehicle.



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GUIDELINES FOR QUESTION PAPER SETTERS

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Q. no.1      Compulsory (Objective type).      20 marks

Q. no.2 to 8      Solve any five questions from Q. 2 to 8 (Subjective type).      16 marks each

The paper setter should take care that (as far as possible) entire syllabus is equally covered.

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SCHEME OF EXAMINATION :

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Theory Two Paper	3 hours	100 Marks each
Practical	2 hours	75 Marks
Journal		15 Marks
Oral		10 Marks
		<b>Total 300 Marks</b>

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INDIAN TECHNICAL EDUCATION SOCIETY, MUMBAI  
MUMBAI

DIPLOMA AUTOMOBILE ENGINEERING SERVICES

(DATES)

THEORY PAPER I: Syllabus for this paper is same as

Certificate Course in Automobile Technician [ATT – I / DATES - I] 100 Marks

THEORY PAPER II: Syllabus for this paper is same as

Certificate Course In Automobile Technician [ATT – II / DATES – II] 100 Marks

THEORY PAPER III: Syllabus for this paper is same as

Certificate Course in AUTO ELECTRICIAN [ATE / DATES - III] 100 Marks

PRACTICAL I & II: Two Separate Practicals

Practical – I same as ATT 100 Marks

Practical – II same as ATE 100 Marks

Total (500 Marks)

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SCHEME OF EXAMINATION :

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Theory Three Papers 3 hours 100 Marks each

Two Practicals 2 hours 75 Marks each

Journal 15 Marks each

Oral 10 Marks each

Total 500 Marks

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**GUIDELINES FOR QUESTION PAPER SETTERS**

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Q. no.1 Compulsory (Objective type). 20 marks

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