

**INDIRA TECHNICAL EDUCATION SOCIETY,  
NASHIK**

**CERTIFICATE COURSE  
AUTOMOBILE MECHANICAL (ATM)**

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

**[ ATM / ATWSA – I ]**

**THEORY SYLLABUS**

**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.

**1. SAFTY, TOOLS & FASTENERS – INDIAN AUTOMOVBILE INDUSTRY**

1. Safety to be observed in Automobile workshop.
2. Tools and equipment's used in Automobile workshop.
3. Automobile fasteners and engine system.

**2. ENGINE (POWER SYSTEM) – DUAL OVERHEAD CAMSHAFT (DOHC)**

1. General information about internal and external combustion engines.
2. Difference between E.C. and I.C. engines.
3. Main Principal of Internal Combustion engine.
4. Definition of cylinder Bore, Stroke, Compression Ration, Hoarse 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 decarborising Arrangements engine overhaul.

**3. PETROL ENGINE**

1. Principle and operation of petrol engine.
2. Four stroke petrol engine.
3. Two stroke petrol engine.
4. Maintenance of petrol engine and possible faults.

**4. DIESEL ENGINE**

1. Principle of Diesel engine and operation.
2. Four stroke Diesel engine.
3. Two stroke Diesel engine.
4. Maintenance of Diesel engine and possible faults.
5. Advantages of diesel engine.
6. Difference between Petrol and Diesel engines.

**5. FUEL SYSTEM – PETROL & DIESEL**

1. Function of fuel i.e. petrol and Diesel, Types of their supply system.
2. Various parts of system and their function i.e. carburettor F.I. pump, fuel pump etc.
3. Trouble shooting and remedies of system on present vehicles.

**6. ENGINE COOLING SYSTEM – COOLANT & RADIATOR PRESSME CAP**

1. Necessity of cooling system and its types with detail functions.
2. Construction & working principles of various parts of cooling system, Radiator Thermostat, water pump etc.
3. Trouble shooting and remedies and maintenance.

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## **7. LUBRICATION SYSTEM**

1. Necessity of lubrication system, various lubrication types, function of parts.
2. Trouble shooting and remedies and maintenance.

## **8. STEERING SYSTEM**

1. Necessity of steering system, construction, working of steering system.
2. Types of steering system.
3. Steering Geometry, Angles i.e. camber, caster, Toe-in, Toe-out, Ackerman principle etc.
4. Trouble shooting and possible faults, wheel Alignment, Wheel Balancing.

## **9. SUSPENSION SYSTEM**

1. Necessity of suspension system.
2. Types of suspension system and its parts and their functions.
3. Construction and functions of stub Axle, Front axle.
4. Faults of suspension system and remedies.

## **10. TRANSMISSION SYSTEM**

1. Uses and function of transmission system, various parts of system.
2. Clutch – Principle, working operation, Types and free play adjustments, maintenance.
3. Gear box – Principle and working function, Construction, types of gear box and types of selector mechanism.
4. Propeller shaft – Construction, working, types of universal joints etc. function of propeller shaft.
5. Final drive – Construction and working.
6. Rear Axle and Differential – Principle, Construction, working type and maintenance differential teeth adjustment.
7. Trouble shooting for every units of Transmission system and remedies.

## **11. BRAKE SYSTEM – INTRODUCTION TO DISC BRAKES**

1. Necessity of brake, types of brake.
2. Working of Hand brake and uses on vehicles.
3. Hydraulic Brake – Principle, Construction, uses, working parts and their function, brakes bleeding.
4. Air Brake – working, uses on vehicle, construction lay out, parts and their function etc.
5. Disc Brake – Principle, working, Operation.
6. Trouble shooting for each types of brake, maintenance.

## **12. WHEEL, TYRE & CHASSIS**

1. Types of wheel and parts of wheel.
2. Size of tyre and maintenance.
3. Chassis – types, construction, lubrication etc.
4. Trouble shooting an suspension system and steering system.

## **13. AUTOMOBILE ELECTRICITY**

2. Necessity of electricity on automobile vehicle.
3. Ignition system – operation, circuit function of parts in system.
4. Battery – Working, uses charging systems, checking and maintenance.
5. Construction & working Principle of electric starter.
6. Construction & function of Dynamo & Alternator a vehicle Preventive maintenance.

## **14. PREVENTIVE MAINTAINANCE**

1. Periodic Check-up.

**SCHEME OF EXAMINATION :**

|                  |         |                  |
|------------------|---------|------------------|
| Theory One Paper | 3 hours | 100 Marks        |
| Practical        | 2 hours | 75 Marks         |
| Journal          |         | 15 Marks         |
| Oral             |         | 10 Marks         |
| <b>Total</b>     |         | <b>200 Marks</b> |

**WEIGHTAGE :**

(Theory paper of Automobile Mechanic)

|                   |      |
|-------------------|------|
| Topic 1, 2, 3 & 4 | 20 % |
| Topic 5, 6 & 7    | 25 % |
| Topic 8 & 9       | 10 % |
| Topic 10          | 15 % |
| Topic 11 & 12     | 15 % |
| Topic 13 & 14     | 15 % |

**GUIDELINE FOR PAPER SETTER :**

|              |  |               |
|--------------|--|---------------|
| Q. 1         | : Compulsory and Objective type                                | 20 Marks      |
| Q. 2 to Q. 8 | : Candidate has to solve any five questions out of these seven | 16 Marks each |

