

**INDIRA TECHNICAL EDUCATION SOCIETY,
NASHIK**

**CERTIFICATE COURSE
AUTO ELECTRICIAN (ATE)**

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

[ATE / DATES – III / ADATES - III]

THEORY SYLLABUS

1. **SAFETY**
Safety precautions to be observed in Auto Electrical Department.
2. **TOOLS, EQUIPMENTS, MEASURING INSTRUMENTS**
[CHECKING INSTRUMENTS]
General Hand tools, soldering materials and method of soldering, standard wire gauge, micrometer, ohmmeter, Ampere meter, voltmeter, meggar, multimeter and their use, Growler Armature Tester. Battery charger.
3. **ELECTRICAL TECHNICAL TERMS AND BASIC ELECTRICITY**
Conductor, Insulator, Resistance current, volt, Power energy, circuit and their types, ohm's law, Potential difference, fuse Terminal – their definitions and unit. Simple problem on ohm's law and power.
4. **MAGNETISM**
Terms used, type and shapes of magnets and properties methods of magnetizing and magnet materials, Electromagnet and 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. **BATTERIES**
Types of batteries, work of Battery on Automobile vehicle, Battery construction, Battery checking method – hydrometer and H.R.D. Battery charging method. Distinguish between lead acid Battery and Alkaline Battery, effect on battery by under charging and overcharging, Trouble shooting of Battery.
6. **DYNAMO AND REGULATOR**
Dynamo principle, Faraday's law of Electromagnetic Induction. Dynamo construction and it's parts checking procedure. Dynamo working, Types of dynamo, Third brush dynamo, Regulator circuit diagram. Types of regulator – it's construction and working, Regulator setting procedure. Trouble shooting.
7. **ALTERNATOR**
Principle of alternator. Main difference between alternator and dynamo. Alternator construction – it's parts making and checking procedure. Alternator working, Voltage Regulator. Types of Regulator. Alternator wiring and charging circuit diagram, Working of Battery Indicator light. Maintenance and trouble shooting.
8. **ENGINE STARTER MOTOR**
Use 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. Types of starter motor – solenoid switch, starter. Motor test. Trouble shooting and maintenance.

9. **IGNITION SYSTEM**

Function of Ignition system. Types of Ignition system. Parts of Ignition system – Ignition coil, Condenser distributor, advance mechanism. Spark plug 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**

Advantages of 12v battery. Earth Return system. Types of wire and wire terminal, wiring harness, precaution to be taken while wiring. Automotive electrical bulbs, Types of switches, use of fuses, wire colour code system. Circuit diagram of head light, side Indicator light Tail light, Brake light, Reverse light etc. Electric Horn and Horn, circuit. Wind screen wiper motor, electrical fuel pump. Heater plug. Fuel gauge, Temperature gauge. Sensors. Wiring diagram of center locking, Remote locking & power windows systems.

