LESSON PLAN 2023-24

SUBJECT :AUTOMOBILE ELECTRICITY (5TH SEM)

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Class No.	Topic	Subtopics	Teaching Aids/Activities
1	Introduction & Purpose of Battery	Function of a storage battery, importance in automotive and industrial use	Battery samples, basic circuit diagram
2	Types of Batteries	Lead-acid, lithium-ion, NiMH, dry cell, maintenance-free, primary vs secondary	Comparison chart, battery model cutaway
3	Battery Construction	Parts: plates, separators, electrolyte, container, terminals	Diagram walkthrough, physical battery demo
4	Battery Capacity & Charging	AH rating, factors affecting capacity, charging methods (manual/automatic)	Charger demo, voltmeter reading practice
5	Testing & Servicing	Specific gravity, voltage test, load test, safety checks	Hydrometer demo, multimeter use, video instruction
6	Maintenance & Safety	Cleaning, topping up electrolyte, terminal care, safety measures	Safety gear demo, maintenance checklist activity
7	Introduction to Starting System	Role in engine start-up, importance in automotive systems	Intro video, starter circuit diagram
8	Principle of Starter Motor	Electromagnetic induction, torque generation, energy conversion	Magnetic field illustration, animated working principle
9	Construction of Starter Motor	Parts: armature, commutator, brushes, solenoid, field windings	Cut section model of starter motor, labeled diagrams
10	Drive Arrangements	Bendix drive, overrunning clutch, gear reduction starter	Physical drive model, animation of drive engagement
11	Control Mechanism	Starter switch, solenoid operation, relay system	Wiring demo, circuit board setup
12	Servicing and Maintenance	Disassembly, cleaning, brush check, continuity test, common faults	Workshop practice, starter fault diagnosis demo
13	Introduction to Generating System	Purpose, overview of charging in vehicles	Diagram of generator in vehicle circuit
14	Fleming's Right-Hand Rule	Rule explanation, direction of current, magnetic field, and motion	Hand rule chart, magnet-coil demo
15	Lenz's Law	Law statement, induced EMF opposition	Coil and magnet demonstration
16	Principle of Generator	Electromagnetic induction, energy conversion	Animated explanation, real-life example

17	Construction of Generator	Armature, field coils, commutator, brushes	Cross-section model of generator
18	Types of Generator	DC generator (series, shunt, compound), basic comparison	Charts, schematic diagrams
19	Voltage Regulator	Function, mechanical & electronic regulators	Regulator demo unit, circuit board display
20	Current Regulator	Overcurrent protection, cut-in/out principles	Relay mechanism demo, volt-amp testing
21	Cut-out Relay	Operation, location in the charging circuit	Cutaway relay, wiring setup
22	Generator Maintenance	Brush inspection, cleaning, bearing lubrication, fault diagnosis	Lab demo, checklist-based maintenance session
23	Introduction & Principle	Need for alternator, electromagnetic induction, AC generation basics	Animated videos, AC/DC comparison, whiteboard sketch
24	Construction of Alternator	Rotor, stator, rectifier, slip rings, bearings	Alternator cutaway model, labeled diagrams
25	RMS & Average Value	Explanation of RMS, peak and average value of AC, waveforms	Graph charts, oscilloscope demo
26	Working of Alternator	Full-wave rectification, voltage regulation, excitation system	Functional alternator demo, circuit diagrams
27	Maintenance & Servicing	Belt tension, bearing check, brush inspection, voltage output testing	Real alternator test bench, multimeter demo
28	Introduction to Ignition System	Purpose and basic working principle	Charts, diagrams, videos
29	Induction Coil	Construction and function in the ignition circuit	Physical coil, wiring diagram
30	Contact Breaker	Operation, points, spark timing	Live demo board, animations
31	Spark Plug	Parts, gap setting, heat range	Cut model, spark plug tester
32	Distributor	Mechanical/vacuum advance, rotor & cap	Distributor assembly demo
33	Condenser	Purpose and placement in circuit	Capacitor testing demo
34	Electronic Spark Timing	ECU-based timing control, curve adjustments	ECU animation, timing curve graph
35	Computer Controlled Ignition	Coil-on-plug system, sensor signal processing	OBD scanner, ECU signal demo
36	Electronic Ignition with Distributor	Contact-less spark generation	Electronic distributor demo
37	Distributor-less Ignition System	Coil pack, Crankshaft Position Sensor	Engine model demo
38	Coil Ignition System	Traditional coil setup and limitations	Coil wiring diagram

39	Magneto Ignition System	Self-generating system, applications	Magneto demo, flywheel inspection
40	Transistorized Ignition System	Switching transistor in ignition, simplified control	Transistor tester, circuit diagram
41	Servicing of Ignition System	Brush, plug, wiring check, cleaning	Workshop demo, servicing checklist
42	Fault Diagnosis	Misfire, weak/no spark, resistance testing	Multimeter test, diagnostic chart
43	Introduction to Lighting	Importance, types of lights in vehicles	Vehicle lighting chart, introductory video
44	Headlight Setting – Theory	Aim, beam pattern, alignment standards	Headlight beam diagram, projector demo
45	Headlight Setting – Practical	Manual and automatic headlight leveling	Real car setup, light meter or wall alignment chart
46	Tail and Stop Lights	Function, wiring, bulb types, dual filament bulbs	Vehicle tail light demo unit, wiring diagrams
47	Indicators (Turn Signals)	Working of flasher unit, wiring layout	Indicator relay demo, actual switch demo
48	Dim and Dip Mechanism	Beam switch control, relay use, hi-lo beam circuits	Multi-position switch demo, wiring and relay activity
49	Introduction to Accessories	Importance of accessories in vehicles, overview	Real accessory catalog, classroom discussion
50	Electric Horn – Theory	Working principle, types of horns (air/electric), relay system	Horn demo circuit, sound comparison
51	Electric Horn – Practical	Mounting, testing with relay and battery, fault diagnosis	Hands-on horn testing, voltmeter use
52	Windshield Wiper	Motor mechanism, linkages, washer pump system	Wiper motor assembly, live working model
53	Fuel & Oil Pressure Gauge	Float system, electrical/mechanical gauges, oil pressure switch	Gauge panel, multimeter test, real dashboard
54	Water Temperature Gauge	Sensor location, function, thermostat connection, heat range	Engine model, gauge testing setup, temperature sensor demo
55	Introduction to Vehicle Wiring	Purpose of wiring, basics of electrical circuits in vehicles	Basic wiring demo board, symbols chart
56	Types of Wiring Systems	Earth return system vs insulated return system	Diagrams, vehicle examples showing both types
57	Wiring Diagram – Two Wheelers	Understanding symbols, color codes, wiring flow	Two-wheeler wiring chart, marker-based circuit tracing
58	Wiring Diagram – Four Wheelers	Complete circuit overview: lights, ignition, horn, indicators	Printed diagrams, projector explanation
59	Electric Wiring Layout in Cars	Routing of wires, fuse box, harnesses, connectors	Physical harness demo, under-dashboard inspection
60	Inspection & Maintenance	Common faults, continuity testing, use of multimeter, wire repair techniques	Hands-on wiring board, fault simulation & diagnosis activity