

Subject: AUTOMOBILE ENGINEERING

1. **IC Engines-** two stroke engines, four stroke engines, petrol engines, diesel engines, SI engine , CI engine, inline engines, radial engine, Wankel engine, Ottocycle, Diesel cycle, Atkinson cycle engine, scavenging, supercharging, turbo supercharger, valve timing, valve overlap, running in period, firing order, engine rating, limiting factors of horse power, engine performance testing and performance curves, abnormal combustion, knocking, detonation, fuel and combustion.

Construction and working of automobile engines- constructional details of parts, material used and functions of cylinder block, cylinder head, gaskets, crankcase, crankshaft, camshaft, piston, piston rings, piston pin ,flywheel, connecting rod, bearings, cylinder liners, valves and valve mechanism, inlet and exhaust manifolds.
2. **Engine System:** Fuel system of petrol engine, Fuel system of diesel engine, ignition system, lubrication system, cooling system.
3. **Chassis and transmission-** braking system, steering system, steering geometry, wheel alignment, suspension system, clutch, gearbox, final drive and differential, wheels and tyres, axles.
4. **Auto Electrical system and electronics** - Lead acid battery, battery rating, battery capacity, battery testing, trickle charging, Generating system- DC generator, alternator, and generator output control; starting system- starter motor, starting drives, solenoid switches, semiconductors, diodes, transistors, sensors- variable resistor-type sensor, non-contact sensors ,proximity sensors, CP sensor, MAF sensor, MAP sensor, oxygen sensor, vehicle speed sensor, knock sensor, TP sensor, rain sensors etc.
5. **Automobile Emission Control:** Automotive emission and its sources, Evaporative emission, Positive crankcase ventilation system (P.C.V), EGR system, Spark control system, exhaust emission control system, carbon canister, Catalytic converter, Pollution norms, photo chemical smoke.
6. **Comfort and safety:** Automobile air conditioning systems, safety features in modern automobiles -Traction control system, Electronic Stability Programme, engine immobilizer, safety belts, Air bags, child lock, ABS, ORVM.
7. **Thermal engineering:** Laws of thermodynamics, Thermodynamic processes, Air standard cycles, properties of steam, boiler and draught, steam turbines, gas turbines, air compressors.
8. **Manufacturing Processes:** sand Casting, Die casting, casting defects, welding methods, gas welding, arc welding, Spot welding, Thermite welding, MIG, TIG, soldering.
9. **Machine Tools:** Lath machine, Grinding machines, Shaper machines, Planner machine, drilling machines, nomenclatures of cutting tools, non-conventional machining processes.



10. **Mechanics of machines:** Kinematics of machines, Mechanical vibration, static balancing dynamic balancing, balancing of rotating mass and reciprocating mass, belt drive, governors.
11. **Refrigeration and Air conditioning-** Air refrigeration, vapour compression refrigeration system, vapour absorption refrigeration system, properties of refrigerants, psychrometry, comfort air conditioning, Industrial air conditioning, effective temperature, cooling loads.

