

Syllabus for Paper II Exam for the post of Technical Assistant, Mechanical Engineering

- Automobile Engineering: Automobile and its development, Classification of automobiles, Transmission System, Steering System, Braking System, Dynamo and Alternator, and Exhaust Emissions.
- Computer Integrated Manufacturing: Introduction to NC, CNC & DNC, Construction and Tooling, Part Programming, System Devices, Problems in CNC Machines, Automation and NC system.
- Engineering Materials: Scope of Material Science, Crystallography, Metals and Alloys, Heat Treatment, Plastics and Advanced Materials.
- Engineering Mechanics: Laws of Forces, Moment, Friction, Centre of Gravity and Simple Machines.
- Fluid Mechanics: Type and Properties of Fluids, Pressure and its Measurement, Flow of Fluids and Flow through Pipes.
- Heat-Transfer: Modes of Heat Transfer, Fourier's Law, Steady State Conduction, Composite Structures, Natural and Forced Convection and Thermal Radiation.
- I.C. Engines: Working principle of two stroke and four stroke cycle, SI engines and CI Engines, Otto cycle, Diesel cycle, Dual cycle, Fuel Supply and Ignition System in Petrol Engine, Fuel System of Diesel Engine, Cooling and Lubrication and Testing of IC Engines.
- Machine Design: Design-Definition, Types of design, necessity of design, Design terminology: stress, strain, factor of safety, factors affecting factor of safety, stress concentration, methods to reduce stress concentration, fatigue, endurance limit, Design Failure, Design of Shaft, Design of Key, Design of Joints, Design of Flange Coupling and Design of Screwed Joints.
- Machining and Machine Tool Operations: Cutting Tools and Cutting Materials, Lathe, Drilling, Boring, Shaping and Planning, Broaching, Jigs and Fixtures and Cutting Fluids and Lubricants, Welding, Pattern Making, Metal Forming Processes.
- Mechanics of Materials: Stresses and Strains, Resilience, Moment of Inertia, Bending Moment and Shearing Force, Bending Stresses, Columns, Torsion and Springs.
- Metrology and Inspection: Linear and Angular Measurement, Measurement of Surface Finish and Measurements of Screw threads and Gauges.
- Refrigeration and air-conditioning: Fundamentals of Refrigeration, Vapour Compression System, Refrigerants, Air Refrigeration System, Vapour Absorption System and Refrigeration Equipment.
- Theory of Machines: Simple Mechanisms, Friction, Power Transmission, Flywheel, Governor and Balancing.
- Thermodynamics: Fundamental Concepts, Laws of Perfect Gases, Thermodynamic Processes on Gases, Laws of Thermodynamics, Ideal and Real Gases and Properties of Steam.
- Turbo-machinery: Introduction to Turbomachines, Classification of Turbomachines, Steam Turbines and Steam Condensers, Gas Turbines and Jet Propulsion.
- Vibrations: Types-Longitudinal, Transverse and Torsional vibrations, Dampening of Vibrations, Causes of vibrations in Machines, their Harmful Effects and Remedies.