

Post – Technical Assistant (Mechanical Engineering)

SYLLABUS

PART – A (20 MARKS)

General Knowledge and Current Affairs A standard pattern similar to one used by Staff Selection Commission for Combined higher secondary level examination or banking clerical examination can be conducted. Current Affairs questions can also be included in this.

General English: Error recognition, Fill in the blanks with appropriate terms, Vocabulary, Grammar with special reference to Sentence Structure, Synonyms, Antonyms etc

General Aptitude & Reasoning: Questions on reasoning and problem solving, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc.

Mathematics: Class 10th Syllabus of NCERT.

Science, Computer application and Other Subjects: Knowledge level to test supervisory skills will also be included. Class 10th Syllabus of NCERT.

PART – B (80 MARKS)

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 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