



राष्ट्रीय प्रौद्योगिकी संस्थान, कुरुक्षेत्र
NATIONAL INSTITUTE OF TECHNOLOGY
(Under the Ministry of Education, Govt. of India)
KURUKSHETRA-136119

RECRUITMENT OF NON-TEACHING POSTS (REF.:ADVT. NO.:03/2023)

Name of the Post	:	Technician (Level - 3) (Mechanical Engineering)
Details of the Scheme & Pattern of Examination:	:	<u>PART A :</u> <ul style="list-style-type: none">• Total Questions :100 (MCQ Type)• Maximum Marks :100• No Negative Marking <u>Breakup</u> <ul style="list-style-type: none">○ General Awareness (20)○ Reasoning (20)○ Mathematics (20)○ Test of English/Hindi Language (30)○ Computer Awareness (10) <u>PART B :</u> <ul style="list-style-type: none">• Specialization (Mechanical Engg.) :30 Questions
Duration of Examination	:	2.5 hours

- The Question Paper shall be Bilingual (English & Hindi) except the Section for the Test of Language wherever applicable.
- The medium of Part-B will be English only.

SYLLABUS OF EXAMINATION

PART A:

General Awareness: Includes questions relating to History, Indian Polity & Constitution, Art & Culture, Geography, Economics, General Policy, Science & Scientific Research, National/International Organizations /Institutions, current events, environment etc.

Reasoning: Includes questions relating to both verbal and non-verbal types, analogies, similarities, differences, space visualization, problem solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship, concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series etc.

Mathematics: Includes questions relating to Simplification, Decimals, Fractions, L.C.M., H.C.F., Ratio & Proportion, Percentage, Average, Profit & Loss, Discount, Simple & Compound Interest, Mensuration, Time & Work, Time & Distance, Tables & Graphs, etc.

Test of English or Hindi: In addition to the testing of candidate's understanding of

the English or Hindi Languages, it's Vocabulary, Grammar, Sentence Structure, Synonyms, Antonyms and its correct usage etc. would also be tested.

Computer Applications: Includes questions on Operating System, MS Office, MS Word, MS Excel, Power Point, Tally, Internet, E-mail, Antivirus and various online tools used in day- to-day office work.

PART B:

o **Mechanical Engineering**

Computer awareness: Basic knowledge of Computer Applications, viz; MS Word, MS Excel, Power Point etc. Internet, MS-DOS, Data Entry, Softwares knowledge, applications of computers in 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 Planing, 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. – ECE

Note:- The Syllabus is suggestive and indicative in nature having only broader areas for reference. The Candidate is expected to have the holistic and expanded knowledge of the subject/syllabus.
