राष्ट्रीय प्रौद्योगिकी संस्थान दिल्ली
NATIONAL INSTITUTE OF TECHNOLOGY DELHI
(शिक्षा मंत्रालय, भारत सरकार के अधीन एक स्वायत्त संस्थान)
(An autonomous Institute under the aegis of Ministry of Education (Shiksha Mantralaya), Govt. of India)
Plot No. FA7, Zone P1, GT Karnal Road, Delhi-110036, INDIA
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F. No: NITD/01/Admn/606/2025-26 Dated: 12.12.2025

Pattern of Examination (Written Test and Proficiency Test) and Evaluation Criteria for all the Advertised Non-Teaching Positions vide Advt. No.: 08/2025

A. PATTERN OF EXAMINATION AND EVALUATION CRITERIA OF WRITTEN EXAMINATION (PART A, PART B, AND PART C):

1. Pattern of Examination and evaluation Criteria (Part A, Part B, and Part C):
   a. The written examination will consist of one paper divided into three parts:

Part	Type	Content	No. of Questions	Marks
A	Objective Type	General Knowledge Test	20	20
B	Objective Type	Domain Knowledge Test	60	60
C	Descriptive Type	Assessment of Practical and Experimental Knowledge	5	20
			85	100

2. Cutt-off / Merit Criteria:
   i. Cut-off / Merit will be drawn on the basis of marks obtained by candidates out of 100 marks in the written examination (Part A, Part B, and Part C).

   ii. Based on the merit as referred in Point 2 (i) above, candidates will be shortlisted in the ratio of 1:6 (i.e. a maximum Six candidates will be shortlisted for each advertised post), in order of merit, for each advertised post, subject to securing the following minimum qualifying marks in the written examination:
      a). UR / EWS: Minimum 60 marks out of 100 marks (60%)
      b). OBC: Minimum 55 marks out of 100 marks (55%)
      c). SC / ST / (PwD / PwBD): Minimum 50 marks out of 100 marks (50%)

3. Number of Questions and Marking Scheme:
   i. Written Test – Part – A shall consist of 20 questions, carrying 01 mark each, and therefore this Part shall be of maximum 20 marks. The evaluation shall be carried out as follows:
      a). 01 (one) mark will be awarded for each correctly attempted question.
      b). 0.25 marks will be deducted as negative marking for each incorrectly attempted question.
      c). No marks shall be awarded for any question that remains unattempted or left unanswered.

   ii. Written Test – Part – B shall consist of 60 questions, carrying 01 mark each, and therefore this Part shall be of maximum 60 marks. The evaluation shall be carried out as follows:
      a). 01 (one) mark will be awarded for each correctly attempted question.
      b). 0.25 marks will be deducted as negative marking for each incorrectly attempted question.
      c). No marks shall be awarded for any question that remains unattempted or left unanswered.

iii. Written Test – Part – C shall consist of 05 questions, carrying 04 marks each, and therefore this Part shall be of maximum 20 marks.
   a). No negative marking will be applicable in Part C.

4. Timing allotment for the examination (Written Examination):
   i. The Written Test (comprising Part A, Part B, and Part C) shall be of 2 hours and 30 minutes (150 minutes) duration for all the positions.

5. In case of bunching / bracketing of candidates in the result of the Written Test, the merit shall be decided in the following order:
   i. Desirable Qualifications: Candidates who possess the desirable qualification(s) prescribed for the post shall be given preference.
   ii. Age Seniority: If the tie remains unresolved, the candidate senior in age shall be given preference.
   iii. Alphabetical Order of Name: If the tie still persists, preference shall be given to the candidate whose name comes first in alphabetical order.
   iv. Draw of Lots: If all the above criteria fail to break the tie, the merit order shall be decided through draw of lots.

B. <u>PATTERN AND EVALUATION CRITERIA OF PROFICIENCY TEST:</u>

1. Proficiency Test:
   i. Candidates shortlisted in the ratio of 1:6 for each advertised post, as per the criteria specified in Point 2 under (A), shall be called to appear for the Proficiency Test.

2. The Proficiency Test shall carry a total of 50 marks and will be qualifying in nature, with the following qualifying marks:
   i. UR / EWS: Minimum 27.5 marks out of 50 marks (55%).
   ii. OBC / SC / ST / (PwD / PwBD): Minimum 25 marks out of 50 marks (50%).

3. Timing allotment for the examination (Proficiency Test):
   i. The Proficiency Test shall be of 1 hour (60 minutes) duration for all the advertised posts.

Sd/-
(Prof. (Dr.) Hitesh Sharma)
Registrar, NIT Delhi

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Syllabus of the Written Test (Part A, Part B and Part C) and the Proficiency Test for the Non-Teaching Positions Advertised vide Advt. No.: 08/2025

TECHNICIAN (MECHANICAL ENGINEERING), PAY LEVEL – 03

Written Test – Part – A (Objective Type – General Knowledge Test) 20 Marks

i. Maths & Numerical Ability: Average, Time and Work, Simple Interest, Compound Interest, Decimal Fractions, Problems on Numbers, Square Root and Cube Root, Time and Distance, Simplification, Numerical Computation etc.
ii. Logical Reasoning: Number Series Compilation, Missing Number Finding, Continuous Pattern Series, Matching Definitions, Missing Character Finding, Coding and Decoding, Logical Sequence of Words, Arithmetic Reasoning, Numerical Reasoning, Data Reasoning and Data Interpretation. etc.
iii. Language & Comprehension: Antonyms, Synonyms, Spelling Check, Common Error Detection, One word substitution, Grammatical error, Idioms and Phrases, Sentence Correction and Completion, Spotting Errors, Sentence Improvement, Sentence Formation, etc.
iv. General knowledge and Current Affairs: NEP 2020, Academic Bank of Credit, Indian Economy, Indian Polity, Indian Constitution, Indian Geography, Days and Years, Basic General Knowledge, Current Affairs, Important Government Schemes, etc.
v. Computer Fundamentals, MS Word, MS Excel, MS Power Point, Internet, Email System, etc.

Written Test – Part – B (Objective Type – Domain Knowledge Test) 60 Marks

i. Mathematics: Sets, Relations and Functions, Algebra, Coordinate Geometry, Calculus, Statistics and Probability, Vectors and Three - Dimensional Geometry, Linear Programming.
ii. Physics: Physical World and Measurement, Kinematics, Laws of Motion, Work, Energy and Power, Motion of System of Particles and Rigid Body, Gravitation, Properties of Bulk Matter, Behaviour of Perfect Gases and Kinetic Theory of Gases, Oscillations and Waves, Electrostatics, Current Electricity, Magnetic Effects of Current and Magnetism, Electromagnetic Induction and Alternating Currents, Electromagnetic Waves, Optics, Dual Nature of Radiation and Matter, Atoms and Nuclei.
iii. Chemistry: Some Basic Concepts of Chemistry, Structure of Atom, Classification of Elements and Periodicity in Properties, Chemical Bonding and Molecular Structure, Chemical

Thermodynamics, Equilibrium Redox Reactions, Organic Chemistry: Basic Principles and Techniques, Hydrocarbons, Solutions, Electrochemistry, Chemical Kinetics, d- and f-Block Elements, Coordination Compounds.

iv. Basic Mechanical Engineering

v. Thermodynamics: General – System open and closed system, thermodynamic properties, process, change of state, cycle. Zeroth law. First law of thermodynamics – conservation of energy, different forms of energies – internal energy, heat, work, kinematic energy, potential energy, application of first law to closed system and open system. Thermodynamic cycles: Otto, diesel and dual combustion cycle. Standard efficiency mean effective pressure.

vi. Manufacturing Processes: Mechanical properties, stress – strain curve for ductile and brittle material etc. Normal and shear stress, Stresses in varying cross-sectional area, Composite bars on axial loading. Manufacturing Processes: Importance of manufacturing processes and classification. Casting: Types of mould, pattern, moulding materials, allowances, sand casting and die casting, casting defects. Metal forming processes: plastic deformation, hot forming and cold forming, basic working principles of rolling and forging processes, Metal cutting: Introduction, generating and forming, working principle, function & specification of simple lathe machine, shaper machine and introduction to CNC machine. Welding: Principles of welding, types of welding – Gas welding, Arc welding, resistance welding, equipment & tools, types of welded joints, brazing & soldering and welding defects.

vii. Computer Literacy: Computer Organization, Basic knowledge of Computer Applications, Input/output Devices, Computer Software-Relationship between Hardware and Software, Operating Systems, MS Word, MS Excel, Power Point etc. Internet, MS-DOS, Data Entry, Software knowledge, applications of computers in mechanical engineering, Digital Signature, Application of information technology in Government for e-Governance, mobile/Smartphone, Information tasks.

Written Test – Part – C (Descriptive Test – Assessment of Practical and Experimental Knowledge) 20 Marks.

Candidates will be expected to explain the principles, operation, and applications of the following workshop instruments, tools, machines, and processes:

a) Use of Vernier Calipers for measurement of dimensions of given objects.
b) Use of Micrometer Screw Gauge for measuring dimensions such as length, thickness, and diameter of given objects.
c) Study and identification of different components of the Lathe machine.
d) Study and identification of different components of the Milling machine.
e) Various operations performed on the Lathe Machine including:

- Plain turning and facing on cylindrical MS specimen
- Step turning and chamfering

- Taper turning as per given specifications
- Manufacturing of external or internal threads on a cylindrical specimen
- Step turning combined with knurling as per given specifications

f) Fabrication of a given 3D feature using the Milling machine.

g) Operations on the given MS plate such as drilling, boring, and reaming, including drilling with internal threading on a specimen.

h) Preparation of a sand mold using a given single-piece pattern.

i) Fabrication of square fit and V-fit from given mild steel pieces.

j) Making a Butt joint using two MS pieces by gas welding.

k) Making a lap joint using two MS pieces by arc welding.

l) Preparation of a sheet metal product such as a funnel.

m) Finishing of surfaces using surface grinding machine (square section).

n) Machining a block on a shaper machine (converting round rod to square).

o) Slot cutting and face milling on a given rectangular specimen.

p) Maintenance of consumable and non-consumable stock registers.

q) Maintenance and usage of laboratory log-books for recording equipment usage.

r) Proper management and storage of various laboratory components and instruments in their respective locations.

s) Basic knowledge of repairing and preventive maintenance of laboratory equipment.

Proficiency Test (Skill Based Assessment of Practical and Experimental Knowledge) 50 Marks

i. Experiments of general/oral nature

a) To use Vernier Calipers for the measurement of the dimensions of a given object. 2. To use the Micrometer Screw Gauge for the measurement of dimensions (length, thickness, diameter) of a given object.
b) To study different components of the Lathe machine.
c) To study different components of the Milling machine.

ii. Experiments of performing nature

a) To perform various operations on the Lathe Machine
   - Exercise on plain turning and facing the given cylindrical MS specimen.
   - Exercise on step turning and chamfering.
   - Exercise on taper turning of the given specification on a cylindrical specimen.
   - Manufacture of external or internal threads of a given specification on a cylindrical Specimen.
   - Exercise on step turning with knurling of the given specification on a cylindrical specimen

b) To make the given 3D feature using milling machine.
c) Exercise on drilling, boring, and reaming on the given MS plate. 8. Exercise on drilling with an internal thread on a given specimen.
d) To prepare a sand Mold, using the given single-piece pattern.
e) To make a square fit from the given mid steel pieces.
f) To make a V-Fit from the given mid steel pieces.
g) To make a Butt joint using the given two M.S pieces by gas welding.
h) To make a lap joint, using the given two M.S. pieces and by arc welding.
i) To prepare a sheet metal product (Funnel).
j) Finishing of a surface on a surface –grinding machine(take square section).
k) Machining a block on a shaper machine (Square from round rod using Shaper).
l) Exercise on slot cutting and face milling of a given rectangular specimen.

iii. Performance evaluation related to laboratory maintenance

a) Maintenance of consumable and non-consumable stock registers.
b) Maintenance and usage of laboratory log-books for using various equipment.
c) Managing the storage of various components in related places.
d) Basic idea of repairing/maintenance of laboratory equipment.