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)
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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 (AEROSPACE ENGINEERING), PAY LEVEL – 03

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

a) 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.
b) 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.
c) 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.
d) 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.
e) Computer Fundamentals, MS Word, MS Excel, MS Power Point, Internet, Email System, etc.

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

a) Mathematics: Sets, Relations and Functions, Algebra, Coordinate Geometry, Calculus, Statistics and Probability, Vectors and Three - Dimensional Geometry, Linear Programming.
b) 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.
c) 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.

d) Basic Aerospace Engineering

e) Thermal and Fluid Mechanics: Properties of fluids, Surface energy and surface tension, Continuity equation and Bernoulli's principle (basic applications), Buoyancy and stability of floating bodies, Atmospheric boundary layer, Laminar and turbulent flow concepts, Pascal law, lift and drag. 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 Brayton cycle. Standard efficiency means effective pressure. Conduction and thermal conductivity, Convection and radiation, Qualitative ideas of black body radiation, Wein's displacement law, and greenhouse effect.

f) Solid Mechanics: Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear, modulus of rigidity, poisson's ratio, elastic energy, thermal expansion. Normal and shear stress, Stresses in varying cross-sectional area, Composite bars on axial loading. Manufacturing Processes: Importance of manufacturing processes and classification. Basic idea of Casting, Welding: Principles of welding and their types, machining processes.

g) 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) Familiarization with Laboratory Instruments

- Pitot tube
- Manometers
- Pressure transducers
- Thermocouples
- Hot-wire anemometer
- Smoke generator

- Wind tunnel balances

b) Use of Measurement Devices and Systems
   - Multimeter (all operations)
   - Power supply (full operation)
   - Tachometer
   - Digital data acquisition systems

c) Workshop Measuring Tools
   - Vernier Calipers
   - Micrometer
   - Other standard workshop instruments

d) Identification and Usage of Connectors and Sensors
   - Recognition and use of connectors and sensors commonly used in aerospace experiments such as pressure taps, strain gauges, thermocouple junctions, and accelerometers.

e) Measurement of pressure distribution on a converging-diverging duct.

f) Visualization of flow patterns (laminar and turbulent) using smoke or dye in a water channel.

g) Measurement of the force exerted by a jet on a hemispherical curved plate.

h) Determination of the coefficient of discharge for a rectangular notch.

i) Study of conduction through a composite wall.

j) Estimation of the convection heat transfer coefficient.

k) Measurement of emissivity for a given material.

l) Surface roughness measurement using a Talysurf instrument.

m) Measurement of surface hardness of a specimen using Brinell and Rockwell hardness tests.

n) Preparation of a free-hand drawing of a 3D model on an A2-size drawing sheet.

o) Creation of CAD drawings for profiles such as airfoils or engineering sections using given data.

p) Development of orthographic projections of a given 3D model using CAD software.

q) Creation of a 3D model from a given 2D drawing of aircraft parts using CAD software.

r) Analysis of the Brayton cycle using MATLAB, EES, or any suitable programming environment.

s) Maintenance of consumable and non-consumable stock registers in laboratories.

t) Proper usage and upkeep of laboratory logbooks for equipment tracking and record-keeping.

u) Appropriate handling, storage, and inventory management of laboratory models, sensors, and instruments.

v) Basic knowledge of the repair and preventive maintenance of laboratory equipment.

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

i. Experiment of general/oral nature

1. Familiarization with the operation and use of the following laboratory instruments:
   a) Pitot tube, manometers, pressure transducers, thermocouples, hot-wire anemometer, smoke generator, wind tunnel balances.
   b) Multimeter (all operations), power supply (full operation), tachometer, digital data acquisition system.
   c) To use Vernier Calipers, micrometer, and other workshop instruments.
   d) Recognition and use of various connectors and sensors used in aerospace experiments (pressure taps, strain gauges, thermocouple junctions, accelerometers).

ii. Experiments of performing nature:

a) Measurement of pressure distribution on a converging-diverging duct.
b) Visualization of flow patterns (laminar/turbulent) using smoke or dye in water channel.
c) To measure the force exerted by a jet on a hemispherical curved plate.
d) To determine the coefficient of discharge of a rectangular notch.
e) Conduction through composite wall.
f) Estimation of Convection heat transfer coefficient.
g) Emissivity measurement of a given material.
h) Surface roughness measurement by Talysurf instrument.
i) To measure surface hardness of the provided specimen using Brinell and Rockwell hardness test.

iii. Experiments of performing nature (software):

a) To prepare free-hand drawing of a 3D model on an A2 drawing sheet.
b) CAD drawing of profiles (airfoil/engineering sections) from given data.
c) To prepare orthographic projections of a given 3D model on the CAD software.
d) To prepare 3D model of a given 2D drawing of aircraft parts on the CAD software.
e) Analysis of Brayton cycle using MATLAB / EES/any programing language.

iv. Performance evaluation related to laboratory maintenance:

a) Maintenance of consumable and non-consumable stock registers in labs.
b) Usage of laboratory logbooks for various equipment.
c) Proper handling, storage, and management of models, sensors, and instruments.
d) Basic idea of repairing/maintenance of laboratory equipment.
e) Basic idea of repairing/maintenance of laboratory equipment.