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

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. **PATTERN AND EVALUATION CRITERIA OF PROFICIENCY TEST:**

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 (ELECTRICAL 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: Arithmetic, Geometric and Harmonic Progressions, Binomial expansion, Matrices, Elementary operations, Rank of a matrix Parabola, Ellipse and Hyperbola, Differentiation of a function, implicit function, parametric function. Successive differentiation. Maxima and Minima, Partial Differentiation, Definite and indefinite Integration. First order and first degree ordinary differential equations.

ii. Physics: Units and Dimensions with Dimensional analysis and their Limitation, Motion in one and two dimensions and Newton's Laws of Motion. Work and Energy and Conservation Laws of energy, Properties of matter i.e. Elasticity, Surface tension and viscosity in fluent motion, waves and vibration. Characteristics of waves and Simple Harmonic Motion, Rotational Motion, Conservation on angular momentum, Gravitation, Newton's law of gravitation, Kepler's law and Satellite, Heat and temperature. Measurement of temperature and mode of transfer of hear and

their laws, geometric optics and simple optical instruments, Simple Law of electrostatics and their use to find the E and potential. Capacitors and dielectric constant, Laser, its principle and use, Superconductivity, Conventional and Non-Conventional energy sources.

iii. Elements of Electrical Engineering: Electrical and Magnetic circuits, EMF, Kirchhoff's law and Faraday's Laws, Network Theorems, AC circuit, RMS value Behaviour of RLC elements, Series and parallel circuits, series and parallel resonance circuits, Transformers, Introduction to single phase and three phase transformers DC Machines, Theory, Constructions and Operation of three phase induction motors, Transmission and Distribution Advantages of high voltages for transmission, Comparison of 3 phase, single phase, 2 Phase and three wire D.C. Systems.

iv. Elements of Electronic Engineering: Measurements & Instrumentations, Errors, standards, accuracy precision resolution, Ammeters, Voltmeters, watt meters Energy meters, insulation tester, multimeter, CRO, measurement of V, I & F on CRO low, medium & high resistance measurement, AC bridges Transducers for measurement of temperature, displacement, communication system, types of modulation, demodulation, Analog Electronics Semiconductor diode circuits, zener diode and zener diode circuits, LED, photo diode, BJT, FET & their configurations and characteristics Biasing, small signal and Large signal amplifier, OP-AMPS, oscillators, regulated power supply.

v. COMPUTER LITERACY: Characteristics of Computer, Computer Organization, Input/output Devices, Computer Software-Relationship between Hardware and Software, Operating Systems, MS-Office (exposure of Word, Excel/spread sheet, Power point). Digital Signature, Application of information technology in Government for e-Governance, mobile/Smartphone, Information tasks.

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.

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 the operation and usage of the following instruments:
- Ammeter
- Voltmeter
- Wattmeter
- Tachometer
- Insulation tester

- Earth tester
- Cathode Ray Oscilloscope (CRO) / Digital Storage Oscilloscope (DSO)
- Function Generator
- Multimeter
- Regulated DC Power Supply

b) Colour and number coding schemes used for resistors and capacitors.

c) Verification of the waveform of a single-phase half-wave rectifier.

d) Verification of Kirchhoff's Voltage Law (KVL) and Kirchhoff's Current Law (KCL).

e) Determination of the turn ratio of a single-phase transformer.

f) Plotting the voltage-current (V-I) characteristic curve of a PN junction diode.

g) Measurement of power using Ammeter-Voltmeter (AV) and Voltmeter-Ammeter (VA) methods.

h) Measurement of voltage, current, and power factor in AC circuits containing resistors and inductors in series.

i) Measurement of unknown resistance, inductance, and capacitance using suitable bridge circuits.

j) Verification of network theorems such as Thevenin's and Norton's theorems.

k) Conducting open circuit and short circuit tests on single-phase transformers to determine their parameters.

l) Analysis of the performance of a single-phase full-bridge rectifier circuit with resistive load using MATLAB/Simulink.

m) Analysis of the performance of a single-phase half-wave rectifier circuit with resistive load using MATLAB/Simulink.

n) Basic familiarity with MATLAB/Simulink environment and its application in electrical circuit simulations.

o) Basic usage of Microsoft Word for document preparation.

p) Basic usage of Microsoft Excel for data analysis and interpretation.

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

i.   Experiments of general/ oral nature

a) Familiarization with the operation and use of the following instruments: Ammeter, Voltmeter, Wattmeter, tachometer, Insulation tester, Earth tester, CRO/ DSO, Function Generator, multimeter and Regulated DC Power Supply etc.

b) Familiarization with connections of house wiring, godown wiring, and staircase wiring.

c) Colour/number coding of Resistors/Capacitors.

ii.   Experiments of performing nature

a) Verification of waveform of single-phase half-wave rectifier.

b) Verification of KVL and KCL.

c) To find out the turn ratio of a single-phase transformer.

d) To find out the V-I Characteristic of PN junction diode.

e) Measurement of Power Using Ammeter-Voltmeter (AV) and Voltmeter-Ammeter (VA) methods.

f) Measure voltage, current, and power factor in AC circuits containing resistors and inductor in series.

g) Measurement of unknown resistance/inductance/capacitance using suitable bridge circuit.

h) Verification of Network theorems.

i) Performing open circuit and short circuit test for single-phase transformer.

iii. Experiments of performing nature (simulations/ software)

a) Analyse the performance of a single-phase full-bridge rectifier circuit with R load in the MATLAB/Simulink environment.

b) Analyse the performance of a single-phase half wave rectifier circuit with R loads in the MATLAB/Simulink environment.

c) Familiarization with MATLAB/Simulink.

d) To explicate MS word for document preparation.

e) To explicate MS excel for data interpretation.