



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	:	Senior Technician (Level - 4) (<u>Electronics & Comm. Engineering</u>)
Details of the Scheme & Pattern of Examination:	:	<u>PART A:</u> <ul style="list-style-type: none">Total Questions :100 (MCQ Type)Maximum Marks :100No 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 (Electronics & Comm. 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 Awareness: 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 Electronics & Communication Engineering

- 1. Computer awareness:** Basic knowledge of Computer Applications, viz; MS Word, MS Excel, Power Point etc. Internet, MS-DOS, Computer Generation & Development, UNIX, Windows, Lotus, SmartSuite, Data Entry, Softwares knowledge, Networking Platforms, applications of computers in electrical engineering
- 2. Basic concepts:** Concepts of resistance, inductance, capacitance, and various factors affecting them. Concepts of current, voltage, power, energy and their units., Kirchhoff 's law, Simple Circuit solution using network theorems. Concepts of flux, mmf, reluctance, Magnetic calculations for conductors of different configuration e.g. straight, circular, solenoidal, etc. Electromagnetic induction, self and mutual induction. Instantaneous, peak, R.M.S. and average values of alternating waves, Representation of sinusoidal wave form, simple series and parallel AC Circuits consisting of R.L. and C, Resonance, Tank Circuit. Poly Phase system – star and delta connection, 3 phasepower, DC and sinusoidal response of R-Land R-C circuit.
- 3. Fundamentals of Electronics Engineering:** Semiconductor Diode, PN basic principles of operation and VI characteristics of PN junction diode, static and dynamic resistance of a diode. Applications of Diode Use of a diode in rectifiers, half wave, full wave and bridge rectifier with shunt capacitor filter, series inductor filter, zener diode and its applications, as avoltag e regulator, light emitting diode (LED), Transistor: Introduction to a transistor, working of aPNP and NPN transistor, input and output characteristics, transistor configurations.
- 4. Digital Electronics:** 1. Number System. 2. Binary addition, subtraction, multiplication and division including binary points 3. Logic Gates and Families a) Concept of negative and positive logic b) Definition, symbols and truth tables of gates. Construction of NOT, AND and OR gates from NAND and NOR gates (universal gates). 5. Logic Simplification a) Postulates of Boolean algebra, DeMorgan's Theorems.
- 5. Power Electronics** 1. Introduction to thyristors and other Power Electronics Devices SCR - Different methods of SCR triggering. - Different commutation circuits for SCR. - Construction & working principle of DIAC, TRIAC & their V-I characteristics 2. Controlled Rectifiers
- 6. Electrical Machines:** (a): D.C. Machine – Construction, Basic Principles of D.C. motors and generators, their characteristics (b): 1 phase and 3 phase transformers – Construction, Principles of operation, equivalent circuit, Tests, Losses and efficiency. (c):3 phase induction motors, rotating magnetic field, principle of operation, equivalent circuit, torque-speed characteristics.
- 7. Unit and Measurement:** Definition, Classification, Fundamental and derived units, systems of units: FPS, CGS, MKS, Unit of physical quantities, symbols, Conversion factors, Measurements of mechanical quantities, electrical quantities.
- 8. Work Power and Energy:** Definition, Work and its units, Measurements of Work, Work done on bodies moving on horizontal and inclined planes (Consider frictional forces also) Concept of Power and its units, Calculations of Power (Simple cases).
- 9. Measurement and measuring instruments:** Measurement of power (1phase and 3 phase, both active and re-active) and energy, 2 wattmeter method of 3 phase power measurement. Measurement of frequency and phase angle.

Ammeter and voltmeter (both moving coil and moving iron type), extension of range wattmeter, Multimeters, Megger, Energy meter, AC Bridges, Use of CRO, Signal Generator, CT, PT and their uses.

10.Sensors and Industrial Instrumentation: Resistive Capacity, Inductive, piezometric, Half effect sensors and associated signal conditioning circuits, Transducers for industrial instrumentation, Displacement (Linear and Angular).

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.
