

## Syllabus for the post of Technician–Pay Level 3

### Dept. of Electrical Engineering

<p><b>Paper I (General Paper and Post related)</b>                  Total No. of Questions – 75 carrying one mark each                  Duration: 2 Hours                  Type of Questions: MCQ</p>	
<p><b>General Paper Syllabus (25 Questions)</b></p> <p><b>1.Aptitude-</b> Profit and Loss, Time and Work, Decimal Fractions, Problems on Numbers, Square Root and Cube Root, Time and Distance, Simplifications.</p> <p><b>2.Reasoning-</b> Number Series Compilation, Missing Number Finding, Continuous Pattern Series, Matching Definitions, Missing Character Finding, Odd Man Out, Blood Relations, Coding and Decoding, Logical Sequence of Words, Arithmetic Reasoning.</p> <p><b>3.General English-</b> Change of voice, Spotting Errors, Sentence Improvement, One Word Substitute, Sentence Corrections, Idioms and Phrases, Communication Skills, Sentence Formation.</p> <p><b>4.General knowledge and Awareness-</b> Current Affairs, Government Schemes, Economics, Geography, Indian History, Indian Polity, Indian Constitution</p>	<p><b>Post Related Syllabus (50 Questions)</b></p> <p><b>1.Units and Measurement</b> - Definition, Classifications: Fundamental and Derived units, Systems of units: FPS, CGS, MKS, Units of physical quantities, symbols, Conversion factors, Measurement of mechanical quantities, electrical quantities, Related problems.</p> <p><b>2.Mass Weight and Density-</b> Definition, Comparison between mass and weight, Comparison between density and relative density/specific gravity, Volume of different geometries (Cube, Cylinder, Cone, Sphere etc.), Related problems.</p> <p><b>3.Work Power and Energy-</b> Definition, Work and its Units, Measurement 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), Concept of Kinetic energy and potential energy, Expressions for P.E and K.E, Principle of conservation of energy, Related problems.</p> <p><b>4.Speed and Velocity-</b> Definition of speed, velocity and their comparison, Scalar and Vector Quantity, Average Velocity, Acceleration &amp; Retardation, Equations of motion, Circular Motion: Relation between circular motion and Linear motion, Related problems.</p> <p><b>5.Heat and Temperature-</b> Definition, Specific Heat and Thermal Capacity, Types of heat: Sensible Heat, Latent Heat, Difference between heat and temperature, Different temperature scales and conversions, Temperature measuring instruments.</p> <p><b>6.Basic Electricity-</b> Source of electricity: Battery, Generator, Thermocouple, Types of electric current: Direct current, Alternate current, Difference between AC and DC, Electrical Terms and units, Ohm's Law, Kirchhoff's law</p>

Relationships between Current, Volt, Resistance and Power, Resistance connections, Simple Problems on series and parallel circuits, Insulators: Properties and Classification, Conductors: Properties and Classification, Electric Power, Horse Power, Work and energy.

**7. Levers and Simple Machines**– Definitions, Velocity ratio, Mechanical Advantages, Efficiency and relationships, Ideal Machines, Lever: Principle, Types (First order lever, Second order lever, Third order lever), Relationship, law of machine, simple machines.

**8. Occupational Safety, Health**- Safety & Health: Introduction and Importance of Occupational Safety and Health, Occupational Hazards: Basic Hazards, Chemical Hazards, Vibroacoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention, Accident & safety: Basic principles for protective equipment, Accident Prevention techniques – control of accidents and safety measures, First Aid: Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person, Basic Provisions: Idea of basic provision of safety, health, welfare under legislation of India.

**9. Environment Education**- Ecosystem: Introduction to Environment, Relationship between Society and Environment, Ecosystem and Factors causing imbalance, Pollution and pollutants including liquid, gaseous, solid and hazardous waste, Energy, Conservation of Energy, re-use and recycle, Global warming: Global warming, climate change and Ozone layer depletion, Ground Water: Hydrological cycle, ground and surface water, Conservation and Harvesting of water, Environment: Right attitude towards environment, Maintenance of in-house environment.

**10. I.T. Literacy**- Computer: Introduction, Computer and its applications, Hardware and peripherals, switching on and shutting down of computer, WINDOWS: Basics of Operating System, WINDOWS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc., MS office:

	Basic operations of Word Processing (Cut /Copy/Paste/ Formatting), Basics of Excel worksheet (Commands/simple formulas and functions), INTERNET: Computer Networks (LAN/WAN), Applications of Internet (Browsing, Searching,Emailing, Social Networking), WEB Browser: World Wide Web (WWW), Web Browsing,Information Security and antivirus tools, Awareness of IT – ACT, Importance of information security and IT act, types of cybercrimes.
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**Paper II (Proficiency Test)**

**Measurement with various instruments:** PMMC & MI meter (Ammeter, Voltmeter), Multimeter (Digital/Analog), Wattmeter, P.F. meter, Energy meter (Digital/analog) Insulation Tester (Megger), Earth tester. Frequency meter, Phase Sequence meter, Tong tester, Tachometer, Digital Oscilloscope.

**Electric Machines:** Single and three phase transformers: winding, characterization, voltage regulations, power factor, testing like open circuit, short circuit testing, load testing, transformer, oil testing.

**Electric rotating machines:** characteristics curves of dc, induction, synchronous type motors and generators: magnetization characteristics, no load and block rotor test, brake test, Heat run test etc.

**Network Analysis:** Superposition and reciprocity theorems, Maximum power transfer theorem, power in three phase circuits, frequency and power factor, three phases balanced and unbalanced circuits, star and delta networks circuits.

**Power Systems:** Characteristics of the microprocessor based· DMT/IDMT over current relay, symmetrical fault analysis in ac network, layout of control cabinet & control panel, study & understanding layout drawing of control cabinet, panel, power & control circuits.

**Testing and connection of control elements:** Isolator·, pushbutton switches, indicating lamps, MCB, fuse, contactors, relays, overload relay, timers, rectifier, limit switches, control, transformers.