सीएसआईआर- भारतीय पेट्रोलियम संस्थान
मोहकमपुर, हरिद्वार रोड, देहरादून,उत्तराखंड- 248005
CSIR-INDIAN INSTITUTE OF PETROLEUM
Mohkampur, Haridwar Road, Dehradun, Uttarakhand-248005

F. No. Rectt/Grade III & II/2025-Pers Dated: 05.02.2026

Advt. No. 07/2025: NOTIFICATION

Sub: Notification of Syllabus for Written and Trade Test for the Posts of Technician- reg.

It is notified for information of the candidates who have been shortlisted for the Trade Test notified vide CSIR-IIP Notification No. Rectt/Grade III & II/2025-Pers dated 04.02.2026 that the Trade Test for the following positions of Technicians will be held shortly. Therefore, the syllabus for the conduct of Trade Test & Written Examination (Paper III) for the Posts of Technician, Area- Chemical Science, Instruments Mechanic & Electrician is being notified as follows:

Sr. No.	Name of the Area	Page No.
1.	Chemical Science	2 & 3
2.	Instruments Mechanic	4, 5 & 6
3.	Electrician	7 & 8

Therefore, in view of the above, all the candidates are advised to prepare for the Trade Test as well as for Objective Type Multiple Choice Question Examination i.e. Paper I, Paper II and Paper III.

All candidates are informed that this Institute has already notified that Paper I will be on General Mental Ability and Paper II shall be on General Awareness and English Language. Paper III shall be on Subject Paper which will vary according to the Posts as mentioned above. Therefore, the syllabus for different subjects of Paper III is being notified along with this notification for the benefit of the candidates so that they can prepare accordingly.

(Anjum Sharma)
Sr. Controller of Administration

Enclosure- As Above

Copy to:

1. Head IT for uploading on Official Website of CSIR-IIP
2. All Notice Boards

Syllabus of Written Test (Paper III) for the Post of Technician, Area – Chemical Science
Post Code – CHEM-2

1. **Basic Chemistry**
   - States of Matter and Physical Properties
   - Atomic Structure (Basic Concepts)
   - Acids, Bases, Salts, pH and Buffers (Basic)
   - Common Inorganic and Organic Laboratory Chemicals
2. **Solutions & Chemical Calculations**
   - Solutions Concentration Terms (%, ppm, Molar, etc.)
   - Preparation and Dilution of Solutions
   - Calculations and Numerical Problems Related to Titration
   - Principles of Acid-Base Titration
   - Filtration, Crystallization, Drying Techniques
3. **Laboratory Glassware & Equipment**
   - Identification and Use of Laboratory Glassware
   - Common Laboratory Apparatus and Their Functions
   - Basic Awareness of Calibration
4. **Laboratory Instrument (General Awareness)**
   Basic Principle and Applications of Common Laboratory Instruments:
   - pH Meter
   - Distillation
   - UV-Visible Spectrophotometer
   - Hot Plate, Water Bath, Hot Air Over, Muffle Furnace

Trade Test Syllabus for the Post of Technician, Area – Chemical Science
Post Code – CHEM-2

1. **Common Laboratory Glassware & Equipment Identification**
2. **Chemical & Laboratory Safety**
   - Chemical Laboratory Safety Symbols
   - Personal Protective Equipment (PPE)
   - Chemical Hazard Classification (Corrosive, Toxic, Flammable)
   - Chemical Waste Segregation, Disposal & Awareness of MSDS
3. **Basic Laboratory Techniques & Operations**
   - Accurate Weighing Using Balances
   - Preparation of Reagents & Standard Solutions
   - Distillation, Filtration, Centrifugation, Decantation
   - Drying, Heating and Temperature Control
   - Basic Sample Preparation Techniques
4. **Volumetric & Simple Analytical Methods**
   - Acid-Base Titration
   - Use of Indicators and Endpoint Detection
   - General Numeric Calculations & Basic Gravimetric Concepts

Syllabus of Written Test (Paper III) for the Post of Technician, Area – Instruments Mechanic, Post Code – ESD-1

1. **Introduction to Instrumentation:** Role of Instruments in Industries, Types of Instruments, Basics of Process Control, Safety and Environment, Personal Protective Equipment (PPE), Fire Safety, Chemical Hazards, First Aid and, Environmental Regulations, Ohm's Law, Series / Parallel Circuits, AC / DC Fundamentals, Conductors, Insulators, Resistors, and basic Electrical Components, Soldering Techniques and understanding of various Electronic Components for Repair and Assembly.
2. **Workshop Practices:** Introduction about various Workshop Processes and Tools, Precision Measurement with VernierCallipers and Micrometers, Fitting, Drilling, Threading, etc. Aging and Maintenance of Tools, Tool Identification and Use, Hand and Power Tools, Multimeters, Oscilloscopes, and Calibrators. Installation, Maintenance, Servicing, and Calibration of Pressure Instruments, as well as other Measuring Devices.
3. **Basic Physics & Chemistry:** Properties of Gases and Liquids, Basic Chemistry concepts relevant to Instrumentation (e.g., pH, conductivity), Measurement & Control Principles, Process Parameters: Principles and Measurement Techniques for Pressure, Temperature, Flow, and Level, Measurement System Fundamentals, Static and Dynamic Characteristics, Types of Errors, and Calibration Techniques in Instrumentation, pH meters, Conductivity Meters, and other devices for Analyzing Industrial Processes.
4. **Pneumatics & Hydraulics:** Basic Principles of Pneumatic and Hydraulic Systems used in Industrial Automation. Industrial Control Systems, PLC, DCS, &SCADA, Understanding Programmable Logic Controllers, Distributed Control Systems, and Supervisory Control and Data Acquisition systems.
5. **Documentation and Interpretation:** Basic Understanding and Ability to Read and Interpret Technical Documentation and Diagrams to Plan and Organize Work.

Trade Test Syllabus for the Post of Technician, Area – Instruments Mechanic
Post Code – ESD-1

1. **Safety Procedures & Basics of Electricity:** Elementary First Aid, Basic hand tools, Precision Measuring Instruments, types & uses of screw threads, Electrical components, Conductor, Semi-conductor& insulators, Resistor, Types of resistor, Ohm's law, kirchoff's law, series & parallel circuit, Types of switches, Magnetism, E. M relay Cells and Batteries, Inductors, Capacitors, RLC circuit, motor, types of motor, DC motors, AC motors, stepper motor, Transformer.
2. **Electrical Measuring Instruments:** Absolute & secondary instruments, Essentials of electrical measuring instruments, DC instruments, PMMC, Extension of range, Shunt & series Resistance, Ohm meter, insulation tester, AC instruments, Types, Electro dynamometer, Watt meter Energy meter, Frequency meter.
3. **Digital Electronics:** Semi-conductor, PN junction diode, Types, Its characteristics, Special Diodes, Transistor, Types & Characteristics of CB, CE, CC configuration, FET & MOSFET, Rectifier, Half wave, Full wave & Bridge Rectifier, Filter, Types, Voltage regulator, Types, Power supply, UPS, SMPS, Inverter, Convertor, Thyristor devices, SCR, TRIAC, DIAC. Oscillators, Types, Operational amplifier, Application of Op-AMP, IC 555 Application, Numbering system – Logic gates & Flip flops.
4. **Motion and Pressure Measurement:** Basic fundamentals of measurement system, Static characteristics and Dynamic characteristics, Types of errors, Arithmetic mean and standard deviation, Stress & strain measuring instruments, Tachometer & speedometers used in instrumentation, Pressure relation with volume, temperature & flow, Units of pressure, Types of pressure, Manometer, Types of pressure sensors, Pressure switches, Transducer, Electrical transducers, Types, Low pressure gauges, types, Calibration, Installation & Service of pressure instruments.
5. **Flow Measurement:** Basic properties of fluids in flow measurement, Unit of flow rate, factors affecting flow rate, Types of flow meter, Head type flow meters, variable area flow meter, quantity flow meter, mass flow meter, open channel flow meter, Positive displacement meter, Advanced flow meter, Solid flow measurement, Solid flow meter types, Calibration, Installation & service of various types of flow meters, DPT.
6. **Level Measurement:** Level measurement, Direct and indirect method of level gauges, Types of level instrument in open channels & closed channels, Level switches, Electrical type level measuring instruments, Conductivity & Capacitance, level instrument solid level measurement, Sonic level detector.
7. **Temperature Measurement :** Heat & Temperature, properties, Units, types, Conversion – Primary & secondary standards, Expansion thermometers in solids, liquids and gases, temperature transmitter, Thermocouple, RTD, Thermistor, Types, Pyrometers, Radiation & optical pyrometer, Recorders, Strip chart, Recorder, Circular chart recorder, Paperless recorder.

8. **Control Systems:** Actuators, types, Pneumatic, Hydraulic & Electrical Actuators, Control Valve, Types, Flow Characteristics, Valve, Body & shapes, Control switches, Types, Capacitive inductive, proximity, Limit switches, micro & IR Switches , Controller, ON / OFF controller, Analog & Digital controller, PI, PD, PID controller, Modes of controllers, Its types, PLC , I/O Device, Simple programming, PLC symbols, Basic PLC operation, Digital control system, HART transmitter, HART communicator, Calibration of HART devices.
9. **Networking:** Types of networks Used in digital instrument system, Connection, Types of Cables, various networking tools, Fundamentals of SCADA and DCS, Types of communication & field instruments, Field bus, HMI, Interfacing, modules, I/O modules, field bus devices basics of RTP, Ethernet, EDDL.
10. **Basic Hydraulic, Pneumatic & Analytical Instruments:** Principles of Hydraulics, Hydrostatic pressure, Pascal's law, Bernoulli's principle, Physical properties of Hydraulic fluid, Types of directional control valve, Classification, Symbols, Accessories, Principles of Pneumatics, Air Treatment, Components of Pneumatic power system, Basic analytical instruments, pH meter, conductivity meter, dissolved oxygen meter.

Syllabus of Written Test (Paper III) for the Post of Technician, Area – Electrician
Post Code- ESD-2

UNIT-1: Basic Electrical Concepts:
Electrical quantities: Voltage, Current, Resistance, Power, Energy, SI units, Ohm's Law, Electrical symbols, Series and parallel circuits

UNIT-2: DC Circuits & Laws:
Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL), EMF and internal resistance, DC circuit analysis, Electrical power and energy calculations

UNIT-3: AC Fundamentals:
Alternating current & voltage, Frequency, time period, RMS, average and peak values, Power factor, Single-phase AC circuits

UNIT-4: Electrical Measuring Instruments:
Ammeter, Voltmeter, Wattmeter, Energy meter, Multimeter, Megger& Earth tester, Instrument connections and errors

UNIT-5: Transformers:
Construction and working principle, Step-up and step-down transformers, Losses in transformers, Efficiency and applications, Transformer ratings

UNIT-6: Electrical Machines (Motors):
DC motors: types and applications, Single-phase induction motors, Three-phase induction motors, Star-Delta and DOL starters, Motor protection basics

UNIT-7: Wiring & Installation:
Types of wiring: Cleat, Batten, Casing & capping, Conduit, Domestic and industrial wiring, Cable types and sizes, Colour codes

UNIT-8: Earthing & Electrical Safety:
Purpose of earthing, Types of earthing, Electrical hazards, Safety rules and PPE, First aid for electric shock

UNIT-9: Switchgear & Protection:
Fuses and fuse ratings, MCB, MCCB, RCCB / ELCB, Relays (basic), Circuit breakers (introductory)

UNIT-10: Power System & Trade Awareness:
Power generation (basic idea), Transmission and distribution system, Substations (basic components), Overhead lines and underground cables, Electrical tools, maintenance & testing

Trade Test Syllabus for the Post of Technician, Area – Electrician
Post Code- ESD-2

1. **Basics Concepts of Electricity –** Concepts of Current, Voltage, Power, Energy and their Units. Laws of Electricity, Network Analysis, Circuits, Ohm's Law, Kirchhoff Law.
2. **AC/DC Machines and Transformer –** Basic Concepts and Working Principles of AC/DC Machines, Inductor Motors, Various Starters, Transformers.
3. **Measurement and Measuring Instruments –** Basic Concepts and Working Principles of Instruments. Ammeter and Voltmeter, Wattmeter, Energy Meter etc.
4. **House Wiring, Industrial Wiring and Earthing –** Rules and Regulations, Common Electrical Accessories and Specifications of House Wiring i.e. Lighting, Fuses, Switchgear, Cb's etc. Concept of Earthing and its Properties.