National Institute of Technical Teachers' Training & Research, Shamla Hills, Bhopal

Advertisement no. 01/2024-25

Information to Candidates on Selection Procedure for the following posts:

Note:

1. **Please note that wherever "Skill Test" is mentioned, it is of a qualifying nature. Only those candidates who qualify through skill test will be allowed to appear in the MCQ/Written test.**
2. **Wherever MCQ/Written test is mentioned, it will contained 100 MCQs and duration will be 2 Hrs. Marking scheme will be 1 mark for correct answer and 0.25 marks will be deducted for incorrect answers.**

Teaching Positions

Information to Candidates on Selection Procedure – Faculty Posts (Professors and Associate Professors)
Selection Procedure - Interview after Scrutiny of applications. List of Eligible candidates for Interview will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.
Date of interview - Date of interview will be announced over the website and informed through e-mail

Non-Teaching Positions

Information to Candidates on Selection Procedure – (1) Stores Purchase Officer
Selection Procedure - Interview after Scrutiny of applications. List of Eligible candidates for Interview will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.
Date of interview - Date of interview will be announced over the website and informed through e-mail

Non-Teaching Positions

Information to Candidates on Selection Procedure – (2) Script Writer
Selection Procedure - Interview after Scrutiny of applications. List of Eligible candidates for Interview will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.
Date of interview - Date of interview will be announced over the website and informed through e-mail

Non-Teaching Positions

Information to Candidates on Selection Procedure –
(3) Sound Recordist

Selection Procedure -

Skill Test and MCQ/Written test will be conducted after Scrutiny of applications. List of Eligible candidates for skill test will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.

Date of Skill Test & MCQ/Written test -

Date of Skill Test & MCQ/Written test will be announced over the website and informed through e-mail

Syllabus for Skill Test

The Skill Test (20 Minutes) will evaluate candidates' practical abilities, including

1. Identification of sound recording equipment and accessories.
2. Sound Recording: Recording a sample audio piece using studio-grade sound recording equipment and Audacity software and providing digital output.

Syllabus for MCQ/Written test

The Written Test, having 100 MCQs (2 Hours), will assess candidates in the following key areas:

a) Science of Sound
- Fundamentals of acoustics and sound propagation.
- Principles of sound behaviour, including reflection, refraction, and absorption.
- Necessity of Reverberation, Typical Reverberation periods of a speech studio, music studio, Drama studios, Television studios, control and monitoring rooms. Absorption coefficients of Materials.

b) Music fundamentals
- Basic concepts in music – pitch, melody, harmony, rhythms, beats. Different musical instruments– string, wind, percussion, and electronic instruments.
- Different forms of music- Indian classical, western, folk, fusion.

c) Audio Electronics
- Different types of cables used with audio equipment, their characteristics, use of amplifiers
- Different types of microphones, their characteristics and mic selection as per application.
- Loud speaker and characteristics of loudspeakers.
- Recording of sound, analogue recording, and digital recording.

d) Introduction to Film & Video Technology
- Overview of film and video production technologies.
- Sound integration techniques in multimedia production.

e) Digital Audio Recording
- Vocabulary of video and sound production.
- Principles of digital audio, including sampling, bit depth, and file formats.
- Digital audio capture, processing, and storage using physical setup and software.
- Single-track, multi-track recording in studio
- Analogue mixing, digital mixing, noise cancelling, equalizing.

f) Editing Studio & Editing Principles
- Techniques in audio editing and studio operations.
- Use of editing software and hardware for high-quality audio outputs.

g) Enhancement of visuals with audio
- Creation and integration of audio effects for enhancement of visuals emphasizing audio synchronization.

h) Media Management, Ethics, and Education
- Ethical considerations and management practices in media production.
- Intellectual property rights and project management.

i) Multi-Camera Shooting, Recording & Editing
- Integrating sound recording in multi-camera setups.
- Skills in live event production, camera coordination, live mixing, and post-production editing.

j) Sound: Production & Reproduction
- Techniques for various media formats, including film, television, and digital media.
- Recording, mixing, dubbing, and mastering audio for diverse applications.

Non-Teaching Positions

Information to Candidates on Selection Procedure –
(4) Video Technician

Selection Procedure -

Skill Test and MCQ/Written test will be conducted after Scrutiny of applications. List of Eligible candidates for skill test will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.

Date of Skill Test & MCQ/Written test -

Date of Skill Test & MCQ/Written test will be announced over the website and informed through e-mail

Syllabus for Skill Test

The skill test (20 Minutes) will evaluate candidates' practical abilities, including

a) Identification of various electronic components, cables, connectors and measuring instruments used in the video studio.
b) Identification of equipment used in the multicamera studio.
c) Use of Cathode Ray Oscilloscope
d) Setting up equipment for recording using a professional-grade single camera.

Syllabus for MCQ/Written test

The MCQ/Written Test, having 100 MCQs (2 Hours), will assess candidates in the following key areas:

1. **Principles and practices in electronics troubleshooting**
   - Basic principles of electrical 3 phase Power A.C. supply, Types of switches and MCBS, Fuse, Power supply installation in studio complex, UPS, spike busters, application and set up, Importance of earthing in installation of power supply
   - Basic concepts in rectification, soldering technique, construction, and repair of single-phase regulated DC Power supply for electronic circuits,
   - Testing of basic electrical and electronic components such as switches, resistors, pots, chokes, capacitors, diodes, Transistors, Thyristors, transformers, Integrated circuit chips, and other electronic components such as relays, contactors, LEDs etc. signal generating circuits
   - Preparation of cables with connectors (Analog and Digital), Techniques for troubleshooting using relevant meters and oscilloscope, assembling, disassembling, and testing of PCB-based components, Use of simulators in testing,
   - Satellite-based communication radio and DTH equipment
   - History sheet of major equipment maintenance, Inventory management of spares and tools**.**
2. **Basic Principles of Digital Images**
   - Image production and reproduction, image capture and control devices, computers, camera scanners, visualizers, tablets, drivers, etc.
   - components of digital images, Basic terms related to digital image resolution, contrast, brightness, alpha, colour models, saturation hue parameters, sharpness
   - Various television formats, digital video formats, Interpreting specifications of Digital TV
   - Working principle of a digital video camera and its key features
   - Different types of Display devices used in the production studio and their working principle
   - Studio monitors Smartboards, Interactive pads, drivers, Wi-Fi devices
   - Troubleshooting display-related issues in recording

3. Basic principles of Sound and music

- Fundamentals of acoustics and sound propagation, sound behavior including reflection, refraction, and absorption. Necessity of Reverberation,
- Basic concepts in music – pitch, melody, harmony, rhythms, beats, decibels, standard tone, noise, Types of music- vocal music and instrumental music, Concept of music crew for composition of music
- Basic principles of sound recording and playing back, placement of microphones and speakers, importance of driver software in computer-based recording, monitoring
- Different musical instruments– string, wind, percussion, and electronic instruments, their connectors and cables.

4. Video Recording hardware and Recording Techniques in multicamera Production

- Vocabulary of video production, television formats, digital video formats
- Camera balancing and testing, connectivity in a multi-camera studio set up and alignment of camera, use of lighting accessories, considerations in setting up of indoor and outdoor camera work,
- Constructional features of professional Vision mixers, specifications of mixers, use of an oscilloscope, waveform monitors, and signal monitoring and testing equipment used in studio
- Preventive maintenance practice for studio equipment
- Role of Camera Control Unit, studio alignment and testing for recording in multicamera production system
- Testing equipment for video and audio, the importance of earthing in the recording set up.
- Media devices for storage and retrieval, codecs used
- Virtual studio set up and testing, Teleprompter application
- Basic awareness of computer hardware, networking devices
- Importance of preventive care of equipment in studio and ENG, air conditioning and ventilation in studio

5. Audio Hardware and recording technique

- Different types of cables used with audio equipment, their characteristics, connectivity, and integration of sound in video, use of amplifiers, Reduction of Noise
- Different types of microphones and accessories: sensitivity of the microphone, Headphones, Speakers, their characteristics, and microphone selection as per application.
- Use of professional audio mixer- analogue mixing, digital mixing, noise cancelling, equalizing
- Principles of digital audio, including sampling, bit depth, and file formats.
- Recording of sound, analogue recording, and digital recording- Single-track, multi-track recording in studio, simple cut-to-cut editing of recorded audio and file output
- Digital media players and devices, driver software, Basic skills in cut-to-cut edit in sound editing software such as Audacity, etc.
- Digital audio synchronization set-up and testing for recording, calibration, capture, processing, and storage using physical setup and software.
- Preventive maintenance practice for audio equipment
- Smart Podium, conferencing solutions and PA Systems

Non-Teaching Positions

Information to Candidates on Selection Procedure –
(5) Research Assistant

Selection Procedure -

MCQ/Written test will be conducted after Scrutiny of applications. List of Eligible candidates for skill test will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.

Date of MCQ/Written test -

Date of MCQ/Written test will be announced over the website and informed through e-mail

Syllabus for MCQ/Written test

The MCQ/Written Test, having 100 MCQs (2 Hours), will assess candidates in the following key areas:

1. **General Knowledge & Awareness -**
   History of India; Geography of India, Economy of India, Constitution of India, Current National & International events.
2. **Verbal Ability & Reasoning -**
   English grammar, Sentence correction, Synonyms, Antonyms, Verbal & non-verbal reasoning, Questions of analogies, similarities, differences, discrimination, observation, relationship, verbal and figure classification.
3. **Numerical Ability and Reasoning -**
   Numbers and Percentage; Ratios & Proportions; Time and Work, Data Interpretation and Statistics, Mental Ability & and Numerical reasoning.
4. **Research Methodology -**
   Basics of research methodology in management and technical education, Problem identification and formulation in research projects, Research question development in the field, Conceptualization and operationalization of variables, Hypothesis development, Research design and its types, Sampling techniques and considerations, Data collection methods including surveys, interviews, and observations, Data analysis techniques (basic concepts), Interpretation of research findings and visualization using computer based applications, Use of Reference Management System applications, Research report writing including structure and components of a research report, data presentation, interpretation of findings, Ethical considerations in research (Intellectual Property Rights, Plagiarism).
5. **Technical Education & Management Knowledge –**
   Basics of technical education including Curriculum development, Teaching and learning methodologies, Assessment and evaluation, Quality assurance, Educational technology and e-learning, Industry-academia collaboration in technical education, Emerging trends and challenges in technical education, Project management concepts and tools, Managerial Issues in Projects, Project Life Cycle, Reporting and Presentation Techniques and Effective management of both behavioral and technical aspects of the project.

Non-Teaching Positions

Information to Candidates on Selection Procedure –
(6) Film Editor

Selection Procedure -

Skill Test and MCQ/Written test will be conducted after Scrutiny of applications. List of Eligible candidates for skill test will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.

Date of Skill Test & MCQ/Written test -

Date of Skill Test & MCQ/Written test will be announced over the website and informed through e-mail

Syllabus for Skill Test

The skill test (30 minutes) will evaluate candidates' practical abilities in the following areas :

- Edit the given anchor-based short video sequence using Adobe Premier software and provide rendered output with sound, music and effects.

Syllabus for MCQ/Written test

The MCQ/Written Test, having 100 MCQs (2 Hours), will assess candidates in the following key areas:

a) **Digital Video and Film Formats:**
   1. Various film and video formats used in production and post-production.
   2. Digital workflows, importing, editing, and exporting media.

b) Art and Visual Perception in Editing:
   1. Principles of visual storytelling and the role of the editor in shaping the narrative. Camera shots, basics of colour theory and lighting,
   2. Use of editing techniques to create tension, emotion, and rhythm in a film.

c) Film Editing Techniques:
   1. Key concepts of continuity editing, montage, jump cuts, match cuts, and reaction shots.
   2. The role of pacing in creating dramatic tension and supporting narrative development, application of chroma effect in editing.

d) Editing Software and Digital Technologies:
   1. Editing Tools available in the professional editing software.
   2. Basic and advanced techniques, including colour grading, effects, and transitions.
   3. File management, codecs, and formats in editing.

e) Sound Editing & Mixing:
   1. Techniques in integrating sound effects, music, and dialogue in the editing process.
   2. Concepts of sound design and its impact on the visual narrative.

f) Film Structure and Script Analysis:
   1. Film structure, scene breakdown, and editing decisions based on script analysis.
   3. Techniques for editing different genres and styles include documentary, narrative, and experimental film.

g) Visual Effects and Motion Graphics:
   1. Basic principles of visual effects and their integration into the film.
   2. Techniques for integrating motion graphics and special effects into the narrative.

h) Ethics in Editing and Media Production:
   1. Ethical considerations in film editing, including the responsibility of the editor in shaping the narrative.
   2. Intellectual property rights, ethical storytelling, and sensitive content handling.

i) Evolution of Editing Technology:

1. Evolution of editing techniques and Technological advancements in editing practices.

j) Collaboration in post-production:

1. The editor's role in collaboration with directors, sound designers, and visual effects teams.
2. Problem-solving techniques during editing in collaboration with other team members,
3. Dealing with corrupted footage, frame rate discrepancies, or sound-video synchronization issues.

Non-Teaching Positions

Information to Candidates on Selection Procedure –
(7) Jr. Stenographer

Selection Procedure -

Skill Test and MCQ/Written test will be conducted after Scrutiny of applications. List of Eligible candidates for skill test will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.

Date of Skill Test & MCQ/Written test -

Date of Skill Test & MCQ/Written test will be announced over the website and informed through e-mail

The Stenography Skill Test.

Those who appear for the test in Hindi should be able to use KrutiDev, DevLys and Mangal on their computer.

Stenographer	Shorthand Speed	Duration	Reading time	Transcription Time
English	80 words per minute	5 minutes	5 minutes	45 minutes
Hindi	60 words per minute	5 minutes	5 minutes	45 minutes

Syllabus for MCQ/Written test

The MCQ/Written Test, having 100 MCQs (2 Hours), will assess candidates in the following key areas:

Section-1: Word Processing

Word Processing: Overview of Word processor Basics of Font type, size, colour, Effects like Bold, italic, underline, Subscript and superscript, Case changing options, previewing a document, saving a document, closing a document and exiting application.

Editing a Document: Navigate through a document, Scroll through text, Insert and delete text, Select text, Undo and redo commands, Use drag and drop to move text, Copy, cut and paste, Use the clipboard, Clear formatting, Format and align text, Formatting Paragraphs, Line and paragraph spacing, using FIND and REPLACE, Setting line spacing, add bullet and numbers in lists, add borders and shading, document views, Page settings and margins, Spelling and Grammatical checks

Changing the Layout of a Document: Adjust page margins, change page orientation, create headers and footers, Set and change indentations, Insert and clear tabs.

Inserting Elements to Word Documents: Insert and delete a page break, insert page numbers, Insert the date and time, insert special characters (symbols), Insert a picture from a file, Resize and reposition a picture **Working with Tables:** Insert a table, convert a table to text, Navigate and select text in a table, resize table cells, align text in a table, format a table, Insert and delete columns and rows, Borders and shading, Repeat table headings on subsequent pages, Merge and split cells.

Working with Columned Layouts and Section Breaks: Columns, Section breaks, Creating columns, Newsletter style columns, Changing part of a document layout or formatting, Remove section break, Add columns to remainder of a document, Column widths, Adjust column spacing, Insert manual column breaks.

Section-2: Spreadsheets

Working with Spreadsheets: Overview of workbook and worksheet, Create Worksheet Entering data, Save, Copy Worksheet, Delete Worksheet, Close and open Workbook.

Editing Worksheet: Insert data, adjust row height and column width, delete, move data, insert new rows and columns, Copy and Paste content, Find and Replace, Spell Check, sheet view Zoom In-Out, insert Special Symbols, Insert Comments, Add Text Box, Undo-redo Changes, - Freeze Panes, hiding/unhiding rows and columns.
Working with Formula: Creating Formula, absolute and relative cell references, Copying and pasting Formula, Common spreadsheet Functions such as sum, average, min, max, date, In, And, or, mathematical functions such as sqrt, power, statistical functions, applying conditions using IF.
Working with Charts: Introduction to charts, overview of different types of charts, Bar, Pie, Line charts, creating and editing charts. Using different chart options: chart title, axis title, legend, data labels, Axes, grid lines, moving chart in a separate sheet.

Section-3: Presentation Tool
Creating a Presentation: Outline of an effective presentation, Identify the elements of the User Interface, starting a New Presentation Files, creating a Basic Presentation, working with textboxes, Apply Character Formats, Format Paragraphs, view a Presentation, saving work, creating new Slides, changing a slide Layout, applying a theme, Changing Colours, fonts and effects, apply custom Colour and font theme, changing the background, Arrange Slide sequence.
Inserting Media elements: Adding and Modifying Graphical Objects to a Presentation - Insert Images into a Presentation, insert audio clips, video/animation, Add Shapes, Add Visual Styles to Text in a Presentation, Edit Graphical Objects on a Slide, Format Graphical Objects on a Slide, Group Graphical Objects on a Slide, Apply an Animation Effect to a Graphical Object, Add Transitions, Add Speaker Notes, Print a Presentation.
Working with Tables: Insert a Table in a Slide, Format Tables, and Import Tables from Other Office applications.
Working with Charts: Insert Charts in a Slide, modify a Chart, Import Charts from Other Office Applications.

Section-4.0: Basics of Internet
World Wide Web: Introduction, Internet, Intranet, URL, web servers, basic settings of web browsers-history, extension, default page, default search engine, privacy and security, creating and retrieving bookmarks, use search engines effectively for searching the content.
Web Services: Cloud- software as service (SAS), Google docs, slides, sheets, Form, Web Sites, web pages, e-Mail, Chat, Video Conferencing.

Section-5.0: General Intelligence and Reasoning
Analogies, Alphabetical and Number Series, Coding and Decoding, Mathematical Operations, Relationships Syllogism, Jumbling Venn Diagram, Data Interpretation and Data Sufficiency, Conclusions and Decision Making, Similarities and Differences, Analytical Reasoning, Classification, Directions, Statement- Arguments and Assumptions etc.

Non-Teaching Positions

Information to Candidates on Selection Procedure –
(8) Electrician Overhead

Selection Procedure -

Skill Test and MCQ/Written test will be conducted after Scrutiny of applications. List of Eligible candidates for skill test will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.

Date of Skill Test & MCQ/Written test -

Date of Skill Test & MCQ/Written test will be announced over the website and informed through e-mail

Syllabus for Skill Test

Skill tests of the candidates for the post of Electrician (Overhead) shall be conducted on the following task (s):

- Testing of earthing of the Electrical Installations
- Testing of continuity of the power cable and electrical circuits
- Use of crimping tools for the cable connections
- Measurement of various electrical parameters using different analog and digital instruments.
- Connection of DOL and Star- Delta Starter
- Testing of transformer oil
- Installation of MCCB/ELCB for the electrical wiring circuit.
- Wiring for the staircase circuit.
- Connection of solar panels for particular voltage and current.
- End termination of Power cables.
- Replacement of DO fuse in the DO fuse assembly.

Syllabus for MCQ/Written test
The MCQ/Written Test, having 100 MCQs (2 Hours), will assess candidates in the following key areas:

Section- 1.0: Safety precautions to be followed during jobs of marking components, filing, drilling, riveting, fitting, joining etc

Safety rules and safety signs for Danger, Warning, caution & personal safety messages. Basic injury prevention, Basic first aid, Hazard identification, avoidance and PPEs. Personal safety and equipment/instruments safety. Effects of electric current on human being. Reasons for shock. Disposal procedure of waste materials. Response to emergencies e.g. power failure, fire, and system failure. Familiarization with signs and symbols of electrical accessories. Introduction to fitting tools, safety precautions. Description of files, hammers, chisels hacksaw frames, blades, their specification and grades. Marking tools description and use. Types of drills, description & drilling machines. Various wooden joints. Marking tools; calipers Dividers, Surface plates, angle plates, scribers, punches, surface gauges, Types, Uses, Care and maintenance. Sheet metal tools: Description of marking & cutting tools. Types of rivets and riveted joints. Use of thread gauge. Description of carpenter's tools Care and maintenance of tools.

Section- 2.0: Electrical wire Joints, Crimping, Soldering and Brazing Wire Joints

Trade tools specifications. Properties of conductors, Fundamental of electricity. Electron theory; free electron, fundamental terms, definitions, units & effects of electric current. Types of wires & cables, standard wire gauge. Current carrying capacity of different conductors. Specification of wires & Cables insulation & voltage grades -Low, medium & high voltage Precautions in using various types of cables / Ferrules. Types of Wire joints & their application. Insulators, semi-conductors and resistors. Voltage grading of different types of Insulators, permissible temperature rise. Solders, flux and soldering techniques.

Section- 3.0: DC & AC circuits, Analog and Digital Instruments

Ohm's Law, Kirchhoff's Laws Series and parallel circuits. Open and short circuits in series and parallel networks. Laws of Resistance and various types of resistors. Series and parallel combinations of resistors. Wheatstone bridge; principle and its applications. Different methods of measuring the values of resistance. Magnetism; Magnetic terms, magnetic materials and properties of magnet. Principles and laws of electromagnetism Self and mutually induced EMFs. Electrostatics: Capacitor Different types, functions, grouping and uses. Inductive and capacitive reactance, their effect on AC circuit and related vector concepts. Comparison and Advantages of DC and AC systems. Related terms frequency, Instantaneous value, R.M.S. value, Average value, Peak factor, form factor, power factor and Impedance etc. Sine wave, phase and phase difference. Active and Reactive power. Single Phase and three-phase system. Advantages of AC poly-phase system. Problems on A.C. circuits. Concept of three-phase Star and Delta connection. Line and phase voltage, current and power in a 3 phase circuits with balanced and unbalanced load. Measuring instruments; Classification of electrical instruments and essential forces required in indicating instruments. PMMC and Moving iron instruments. Measurement of various electrical parameters using different analog and digital instruments viz., multi-meter, Wattmeter, Energy meter, Phase sequence meter, Frequency meter, etc. Measurement of energy in three phase circuit. Important common applicable IE rules. Meter Reading; - Description of MRI - Reading of Meter by MRI.

Section- 4.0: Earthing Installations

Importance of Earthing. I. E. Rules for earthing conduits using earth clips and earth wire. Plate earthing, pipe earthing grid/mesh earthing and chemical earthing. Earth resistance, earth leakage current and circuit breaker. Difference between grounding and earthing.

Section- 5.0: DC Machines and Starters

DC Machines; General concept of rotating electrical machines. Principle of DC generator. Use of Armature, Field Coil, Polarity, Yoke, Cooling Fan, Commutator, slip ring and Brushes, Laminated core etc. E.M.F. equation Separately excited and self-excited generators. Series, shunt and compound generators. Armature reaction, Commutation, inter poles and connection of inter poles. Parallel Operation of DC Generators. Application, losses & efficiency of DC Generators. Principle and types of DC motors. Changing the direction of rotation. Methods of speed control of DC motors.

Section- 6.0: Small transformers, 1ϕ& 3ϕ AC motors and Alternators including AC motor starters

Transformers, AC motors, starters and Alternators: Working principle, construction and classification of transformers. Single phase and three phase transformers. Testing of transformers. Principle of operation of AC motors and generators, components and various types.

Motor Starters: Different types of starters for AC motors, its necessity, basic contactor circuit, parts and their functions. Basic knowledge of soft starter. Winding of small transformers and motors:

Concentric/ distributed, single/ double layer winding and related terms. Troubleshooting of single-phase AC induction motors and universal motor.

Section- 7.0: Domestic Wiring

Introduction and explanation of electrical wiring systems, cleat wiring, Casing-capping, CTS, Conduit and concealed etc. IE Rules related to wiring, National Building codes for house wiring, specification and types, rating & material. Minimum load capacities (W/m2) of various buildings. Electrical load categories. Terms; Maximum demand, Load factor and Diversity factor, etc. Various wiring accessories/ electrical fittings e.g. switches, fuses, lamp holders, plugs, brackets, ceiling rose, cut out relays, sensors, voltage regulators, MCB, ELCB, MCCB etc. Grading of cables and current ratings. Principle of laying out of domestic wiring. Selection of switchgear. Voltage drop concept. Wiring materials used for PVC cables, Indian standards regarding the above wiring such as clip distance fixing of screws, cable bending etc. Introduction to estimation procedure, PVC casing and capping materials, sizes and grades etc. Conduit pipe wiring materials and accessories, types and sizes of conduit. Branching of circuits with respect to loads such as lighting and power. Layout of Light points, fan points, heating loads etc., their controls, main switches, distribution boards as per IE rules. Power, control, Communication and entertainment wiring. Wiring circuits planning, permissible load in sub-circuit and main circuit.

Section- 8.0: Commercial Wiring

Wiring in commercial building their special precautions as per I.E. rules. Different types of wiring - Power, control, Communication and entertainment wiring. Wiring circuits planning, Cabling in healthcare facilities; importance of grounding, shielding and routing in accordance with life safety codes to minimize interference with medical equipment. GFCI (Ground-fault circuit interrupter) receptacles. EV Charging basic theory, EV Charging safety requirements.

Section- 9.0: Industrial Wiring

Adverse conditions likely to affect the installation. Degree of mechanical and electrical protection necessary. Peak-Non-peak Loads in Office Buildings, Lighting Design; lighting power density, Estimation of load, cable size, bill of material and cost. Inspection and testing of wiring installations. Special wiring circuit e.g. hospital, go down, tunnel and workshop, etc. Cable Management: Types of cables, their use, Various cable gland, Introduction to IP ratings (Ingress protection) and IP Codes format. Importance of Bonding and grounding, various types. Testing of cables, locating faults, open circuit, short circuit and leakage in cables. Estimation & costing for wiring systems.

Section- 10.0: Power and control circuits

Different control elements and equipment, their symbols. Power and control schematic drawings with interlocks. Relay ladder logic. Relay and control panel wiring. Circuits of various electrical appliances and controls. Power Distribution network drawings. Control Panel Wiring; Control panel components; DIN rails, trucking, connector blocks, screw terminals, relays, contactors, protective units, fuses, fuse holders; chassis mounted, fuse-links, resistors; fixed, variable, capacitors, switches, lamps, labelling grommets and clips etc. Cable forming; template, wiring schedule, run out sheet, binding, continuous lacing, loop tie, lock stitch, finish knot, breakouts, lacing breakouts, spot ties, laying of wires, twisted pair, Cable markers and color codes etc. Connections and routing of cables. Consideration of EMI/EMC Conductors of different circuits. Symbols and use of relay contacts: NO, NC, changeover, make/break after delay. Testing of various control elements and circuits.

Section- 11.0: Batteries and solar cell

Chemical effects of electric current and Laws of electrolysis. Explanation of Anodes and cathodes. Types of cells, advantages/ disadvantages and their applications. Lead acid cell; Principle of operation

and components. Types of battery charging, Safety precautions, test equipment and maintenance. Grouping of cells for specified voltage and current. Principle and operation of solar cell, Types of solar cell.

Section- 12.0: LT/HT underground cables

Underground cable joints: Need of cables, advantages and disadvantages, various types viz., PVC, XLPE, PILC, oil filled, etc. Cable insulation & voltage grades. Joints and terminations; remolded, heat shrinkable, extrusion molded joints Slip on, cold shrink terminations. Types of connectors used in the cable, current path. Methods of conductor connection, contact resistance. Galvanic corrosion and use of bimetals. Connectivity for cable screen and armour, mechanical protection Kits for joints and terminations. Cable termination to equipment Standards and testing; type, routine, field test, Stress control.

Section- 13.0: Domestic appliances

Working principles and circuits of common domestic electrical appliances; Bell, buzzer, electric iron, kettle, cooking range, geyser, induction heater, mixer, grinder, juicer, food processor, fan, pump set, washing machine, refrigerator and air conditioner etc. Concept of Neutral and Earth.

Non-Teaching Positions

Information to Candidates on Selection Procedure –
(9) Mason-cum-Plumber

Selection Procedure -

Skill Test and MCQ/Written test will be conducted after Scrutiny of applications. List of Eligible candidates for skill test will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.

Date of Skill Test & MCQ/Written test -

Date of Skill Test & MCQ/Written test will be announced over the website and informed through e-mail

Syllabus for Skill Test

Skill test of the candidates for the post of Masson cum Plumber shall be conducted on following task(s).

- Brick work in wall construction: Laying of bricks (at least 3 layers) using cement mortar
- Cutting and shaping of Bricks (Queen and King Closer)
- Checking of Vertical alignment of Brick work
- Plastering of a given portion of the Wall using 1:4 cement Mortar.
- Checking of Horizontal and Vertical alignment.
- Cutting and Threading of Pipes
- Installation of Nahani Trap.
- Installations of new pipe in bathrooms
- Installation of Kitchen Sink.
- Connecting outlet pipe with OHT.
- Installation of an IWC including cistern & complete fittings etc..

Syllabus for MCQ/Written test
The MCQ/Written Test, having 100 MCQs (2 Hours), will assess candidates in the following key areas:

1. **Brickwork in Foundation & Walls**
   - Physical tests of bricks
   - Soaking of bricks prior to laying
   - Cement mortar specifications
   - Preparation of Cement mortar for brick work
   - Laying of bricks as per norms
   - Thickness of Cement mortar in brick work
   - Wall alignment, plumb checking
   - Filling of joints, racking of joints
   - Curing of Brick work
2. **Fixing doors &windows frames in room /cubical**
   - Correctly measure and mark the layout and build room / cubical including door and window.
   - Practice of check the holdfast position and grout it between bricks / blocks.
   - Hold fast / Rawl plugs location & grouting as per instruction

   Checking of alignment and Plumb

3. **Identification and use of basic tools equipment & materials**
   - Identification of basic hand tools like Mason trowel, brick harmer etc. and their selection based upon use and application.
   - Identification of basic power tools related to masonry like drill machines, compactor, vibrators etc. and their selection and application.
   - Identification of basic materials related to masonry used in construction works like bricks, Coarse and Fine Aggregates (CA, FA), cement, rubble, Paint etc.
4. **Method and types of plastering**
   - Carry out plastering works of different proportion,
   - Identify the defects in plastering and adopt corrective measures,
   - Soaking of bricks before lying and fill the gap between the bricks with required materials.
   - Practice to prepare surface properly
   - Knowledge about nominal mixes.
   - Knowledge of different types of basic floorings.
5. **Brick soling & PCC Flooring**
   - Practice the correct procedure for brick soiling and PCC flooring.
   - Basic reading capabilities enabling reading at signs. Notice, caution at site.
   - Introduction to simple drawing
6. **Preparation of Cement Mortar & Concrete Mix**
   - Mortar mixing procedure ingredients of mortar and workability and curing
   - Various types of mortars
   - Preparation of mixing platform, right selection of ingredients of mortar and right method of mixing
7. **Use of different types of bonds in basic brickwork**
   - Knowledge of visual and physical quality of bricks, basic types of bonds, types of closures & joints.
   - Instruments like plumb bob, straight edge, right angle and their use.
8. **Introduction to Plumbing Trade: -**
   - Introduction, Importance & scope of trade, basic fitting operations, tools used in trade.
9. **Inner & Outer Thread cutting on Metal & Studs, pipes & fittings accessories**
   - Different types of pipes (GI, CI, DI, PVC/ CPVC, PPR and HDPE etc)
   - Pipe Fittings (Socket, Elbow, Tee, Union, Bend, Cap, Plug, Cross, Ferrule etc)
10. **Laying of pipe line using Joints, fixing Cocks & valve –**
    - Description & Types of fittings for different joints & different pipes - CI, HCI, AC, AC Pressure, DI, GI Pipes.
    - Joints: - Flange joint, Socket joint with lead, Detachable joint, Socket & Spigot, Methods of Joining & Precautions.
11. **Installation and maintenance of Electric pumps-**
    - Plumber's materials Lead, tin, Zinc, solder, copper, red lead etc. and their uses,
    - Water supply system of a small town,
    - Description and types of pumps
12. **Removal of leakage in pipe line –**
    - Method of dismantling and renewal of the valves and pipes, Leaks in pipes and noises in plumbing, water meter installation, air lock in pipes and its removal.

13. Construction of Inspection chamber, manhole, gutter, septic tank, socket –

- Types of traps, Layout of drainage system, description of
- drains, cesspools, soak pits, septic tank etc

14. Installation & maintenance of water meter and fixtures used in water supply system –

- Erecting rain water and drainage pipe system,
- Installation of sanitary fittings,
- Inspection and testing of water supply system,
- Pipe alignment and slope,
- Description of sanitary fittings,
- Concealed flushing cistern,
- Test for water supply pipes.

15. Fitting and maintenance of Fixture –Domestic drainage system:

- General layout, one pipe system, specifications of Materials required. Method of testing leakage.
- Different types of traps, ventilation, anti-siphonage and sinks. About Fire hydrants and their fittings

Non-Teaching Positions

Information to Candidates on Selection Procedure –
(10) Plumber

Selection Procedure -

Skill Test and MCQ/Written test will be conducted after Scrutiny of applications. List of Eligible candidates for skill test will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.

Date of Skill Test & MCQ/Written test -

Date of Skill Test & MCQ/Written test will be announced over the website and informed through e-mail

Syllabus for Skill Test

Skill test of the candidates for the post of Plumber shall be conducted on following task(s).

- Cutting and Threading of Pipes
- Installation of Nahani Trap.
- Installations of new pipe in bathrooms
- Installation of Kitchen Sink.
- Connecting outlet pipe with OHT.
- Installation of an IWC including cistern & complete fittings etc..

Syllabus for MCQ/Written test

The MCQ/Written Test, having 100 MCQs (2 Hours), will assess candidates in the following key areas:

1. **Professional Knowledge**
   - Importance of safety and general precautions required for the trade.
   - Importance of the trade.
   - Types of work to be done.
   - Scope of a plumbing work.
   - Types of services have to plan.
   - Basic Bench fitting
2. **Inner & Outer Thread cutting on Metal & Studs, pipes & fittings accessories**
   - Different types of pipes (GI, CI, DI, PVC/ CPVC, PPR and HDPE etc)
   - Pipe Fittings (Socket, Elbow, Tee, Union, Bend, Cap, Plug, Cross, Ferrule etc)

   Different types of Thread cutting
3. **Carry out cutting of Pipes of Different diameters in different angle and Joining of pipes by gas welding, Soldering and Brazing.**
   - Purpose of Gas welding.
   - Method of gas welding
   - Safety precautions to be observed -Methods of soldering and brazing -fluxes used & Types of fluxes precautions to be observed.
   - Hard & soft solders -their properties, composition and uses.

4. **Construct Masonry brick wall and RCC casting. Brick wall cutting for concealing pipe line**

Mason's works: -

- Names and description of Mason's hand tools and their uses.
- Method of making holes in walls and floors.
- Types of tools used and various Processes.
- Concept of bricks, lime and cement.
- Preparation of mortars with various materials of varying composition.
- Common brick joints.
- Description of bonds.
- Scaffolding &plastering.
- Define Plain cement concrete, RCC and its proportion,
- Grades of coarse aggregate and fine aggregate,
- Knowledge of waterproofing compound.
- Knowledge of Building Plan and Cross section of wall.
- Identify plumbing services required for each type of building according to usage.

5. **Carry out Cutting and Bending of Pipes using Plumber's tools and equipment**.
   - Description of plumber tools and Equipment- Ratchet brace, Threading die, Pipe wrench, sliding wrench, Spanner set, Chain Wrench etc. and their safety.
   - Care & use of tools.
   - Pipes of different kinds
   - Method of Pipe bending in different dia.
   - Plumbing Symbols and Code for Tools & Materials on water line.
6. **Join Various type of PVC pipe by heat process or Welding.**
   - Equipment and tools for hot gas welding and electric hot plate for PPR pipe joints

7. **Construct complete pipe line circuit with different types of Joints and fixing Cocks & valve on Pipe line**

   - Types of fittings for different joints & different pipes.: - CI, HCI, AC, AC Pressure, DI, GI Pipes.
   - Joints: - Flange joint, Socket joint with lead, Detachable joint, Socket & Spigot joints etc.
   - Description of pipe fittings.
   - Methods of joining and their uses.
   - Precautions to be taken while fixing

8. **Carry out Cutting of Different Types of PVC Pipe, joining and laying.**
   - Different kinds of Joints, Fittings and Materials in joining pipes: - PVC/CPVC, PPR and HDPE etc.

9. **Perform Water analysis test, Water Pressure test and Water distribution system by using Pipe line.**

Composition of Water: -

- Sources of water
- Hard & Soft water, temporary hardness &permanent hardness.
- Impurities of water – organic and inorganic impurities.
- Water purification stages and methods.
- Static water pressures and measurement of pressures. Bursting pressure,
- Expansion of water on freezing and heating.
- Bernoulli's principles

- Pascal's law.
- Pressure of water on the sides of cistern or tank.
- Water hammer in pipes.
- Description and working of water hammer arrester

10. Align and lay humid pipe line of different dia. and fitting & maintenance of drainage pipe line

- Use of hummed pipes of different sizes.
- Method of laying out pipes alignment and joining.
- Description of various pipe joints- straight, Branch, Taft and blow, Expansion joints. Solders and fluxes used in joints

11. Install and maintain different Electric pumps

- Description of Plumber's materials Lead, tin, Zinc, solder, copper, red lead etc. and their uses.
- Water supply system of a small town.
- Description and types of pumps viz. suction pump, Centrifugal pump etc. Contamination of water in a well.

12. Join fittings for different purposes on PVC pipe line

- Description of pipe dies, their uses, care and precaution.
- Metric specification of various pipes.
- Standard pipe threads.
- Method employed for bending, Joining and fixing PVC pipe.
- Joining material for water and gas pipes.
- Use of blow lamp.

13. Construct inspection chamber, manhole, gutter, septic tank, socket etc

- Inspection chamber, septic tank, description of drains, cesspools, soak pits etc.
- Types of traps
- Layout of drainage system

14. Test pipe line as per site drainage pipe line layout.

- Method of bending pipes by hot and cold process.
- Method of testing drainage lines

15. Perform removal of leakage in pipe line.

- Method of dismantling and renewal of the valves and pipes. Leaks in pipes and noises in plumbing.
- Installation of water meters. Air lock in pipes and its removal

16. Install, fix & maintain different valve & cock and sensor system of sanitary fittings

- Description of cocks & valves-their types, materials & advantages for particular work.
- Description of different type of diverts i.e. two way and three way
- Sensor system for urinals and wash basin etc.

17. Install & maintain water meter and water supply for different fixtures.

- Erecting rain water and drainage pipe system,
- Installation of sanitary fitting s, inspection and testing of water supply system.
- Pipe alignment and slope. -Prevention of water hammer.
- Storage tanks for general water supply propose.
- Test for water supply pipes.

- Description of sanitary fittings,
- General points to be observed when choosing sanitary.
- Description of concealed flushing cistern

18. Demonstrate method of bending for different materials & different pipe joint

- Method of bending galvanized mand other heavy pipes.

19. Perform fitting and maintenance of Fixture at different place
Domestic drainage system:

- General layout, one pipe system, specifications of
- Materials required.
- Method of testing leakage.
- Different types of traps, ventilation, anti-syphonage and sinks.
- About Fire hydrants and their fittings.

20. Carry out fitting, fixing & laying installation of hot & cold-water pipe line and symbolizing.

- Concept of heat and Temperature.
- Method of transmission of heat.
- Heating system by different thermal units.
- Domestic hot and cold water.
- General layout, specification of materials required and Connection of pipes to mains.
- Tracing leakage.
- Repairs to service main.
- Domestic boilers and Geysers.
- Method of ventilating pipe.
- Precaution against air
- Poisoning.
- Fixing of solar water system

21. Repairing& reconditioning, scraping & painting of sanitary fittings pipe line:

- Corrosion - causes and remedies, prevention.
- Corrosion due to electrolytic action.
- Effect of water and frost on materials.
- Layout of pipes as per drawing.
- Analysis quantity measurement and abstract rate of plumbing and sanitary work.
- Bill of Quantity and Estimation: -
    - Preparation of bill of quantity
    - Preparation of Estimation

22. Read and apply engineering drawing for different application in the field of work.

Introduction to Engineering Drawing and Drawing Instruments–

- Conventions
- Sizes and layout of drawing sheets
- Title Block, its position and content
- Drawing Instrument

Free hand drawing of–

- Geometrical figures and blocks with dimension
- Transferring measurement from the given object to the sketches.
- Free hand drawing of hand tools and measuring tools.

Drawing of Geometrical figures:

- Angle, Triangle, Circle, Rectangle, Square, Parallelogram.
- Reading of dimension and Dimensioning Practice.

Symbolic representation–

- Different symbols and Pipe joints used in the trade.
- Reading of layout plan drawing in piping

23. Basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study

Unit, Fractions

- Classification of unit system, Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units, Measurement units and conversion, Factors, HCF, LCM and problems,
- Fractions - Addition, subtraction, multiplication & division,
- Decimal fractions - Addition, subtraction, multiplication & division
- Solving problems by using calculator

Square root, Ratio and Proportions, Percentage -Square and square root

- Simple problems using calculator
- Applications of Pythagoras theorem and related problems
- Ratio and proportion
- Ratio and proportion - Direct and indirect proportions
- Percentage - Changing percentage to decimal and fraction

Material Science

- Types metals, types of ferrous and non-ferrous metals
- Physical and mechanical properties of metals
- Properties and uses of insulating materials

Mass, Weight, Volume and Density

- Mass, volume, density, weight and specific gravity.
- Related problems for mass, volume, density, weight and specific gravity

Heat & Temperature and Pressure

- Concept of heat and temperature, effects of heat, difference between heat and temperature, boiling point & melting point of different metals and non-metals
- Scales of temperature, Celsius, Fahrenheit, kelvin and conversion between scales of temperature

Basic Electricity

- Introduction and uses of electricity, molecule, atom, how electricity is produced, electric current AC, DC their comparison, voltage, resistance and their units

Mensuration

- Area and perimeter of square, rectangle and parallelogram
- Area and perimeter of Triangles
- Area and perimeter of circle, semi-circle, circular ring, sector of circle, hexagon and ellipse
- Surface area and volume of solids - cube, cuboid, cylinder, sphere and hollow cylinder
- Finding the lateral surface area, total surface area and capacity in litres of hexagonal, conical and cylindrical shaped vessels

Trigonometry

- Measurement of angles

- Trigonometrical ratios

Non-Teaching Positions

Information to Candidates on Selection Procedure –
(11) Multi Skill Attendant

Selection Procedure -

MCQ/Written test will be conducted after Scrutiny of applications. List of Eligible candidates for skill test will be uploaded on website and will be sent to candidates on email. List of ineligible candidates will also be uploaded on website for inviting proof of eligibility, if any.

Date of MCQ/Written test -

Date of MCQ/Written test will be announced over the website and informed through e-mail

Syllabus for MCQ/Written test
The MCQ/Written Test, having 100 MCQs (2 Hours),will assess candidates in the following key areas:

Section-1.0: Mathematical & Reasoning Ability:

Integers and Whole Numbers, LCM and HCF, Decimals and Fractions and the relationship between Numbers, Fundamental Arithmetic Operations, Percentage, Ratio and Proportion, Number System, Work and Time, Direct and inverse Proportions, Averages, Simple Interest, Profit and Loss, Discount, Area and Perimeter of Basic Geometric Figures, Distance and Time, Lines and Angles, Interpretation of simple Graphs and Data, Square and Square roots.

Alpha-Numeric Series, Following Directions Similarities and Differences, Jumbling, Non-verbal Reasoning based on diagrams, Age Calculations, Calendar and Clock

Identification of Various shapes and their applications

Calculation of Areas, Volume and Perimeter of various geometrical shapes

Section-2.0: Social Science/ General Awareness and English & Hindi Language:

History- Nationalism in India, The age of Industrialization.

Geography- Water resources, Minerals & Energy resources, Manufacturing Industry.

Political Science- Fundamental Rights, Overview of Indian Constitution & Democracy.

Responsibilities as a citizen and Economics- Sectors of Indian Economy. Basics of English language and its vocabulary, basic grammar, comprehension

Basics of Hindi language and its vocabulary, basic grammar, comprehension

Section-3.0: Computer and Office Management:

Basic computer Hardware, Software-MS Office, Windows Operating Systems, Ten Networking, Internet Applications, Social media platforms.

Meaning of Office, Functions and Importance, Paperless Office, Elements of Office Environment like Ventilation, Cleanliness, Sanitation, Air Conditioning, Noise Internal and External, House Keeping etc.

Handling the mail, Filing and Indexing, Files/File Folders/Filing Cabinet of different types, Office Machines: Function of Photocopier, Printer, Scanner ,EPABX, Bio-metric Machines, Security systems, Franking Machines and other office related equipment

Work ethics & positive attitudes- Integrity, Honesty, Courage, Self-Confidence, Interpersonal relations.

Section-4.0: General Science and Safety and in Labs

Basic terms related to electricity; Charges, Potential difference, Voltage, Current, Ten Resistance, Single phase and Three phase supply, Primary and Secondary cells/ battery.

Environmental issues & challenges - Bio-degradable and Non Bio-degradable substances, Reduce, Reuse & Recycle (3Rs).

Safety signs / symbols - for danger, warning, hazard, Types and working of fire extinguishers, First aid, Personal safety & Personal Protective Equipment, Response to emergencies- Power failure, Computer

Section-5.0: Common Instruments/ Equipment/ Devices used in Labs/ Workshop

Measuring System, description & application of Simple Measuring Instruments & Twelve Devices- Vernier Caliper, Screw Gauge, Pressure Gauge, Thermometers, Dial Gauge, Multimeter, Voltmeter, Ammeter, Physical Balance etc.

Commonly used Tools/Instruments/Equipment- Hand tools, Screw Driver, Hand Electric Tester, Vices, Hammers, Chisels, Files, Drills, Drill Machine, Soldering Gun, Different Types of Screws, Types of Bolts, Nuts and Studs, Identification of Glasswares used in Science lab.

Commonly used materials, types & uses - Bricks, Sand, Concrete, Timber, Paints, Metals, Plastics, Wiring materials, lab cleaning materials etc.

Handling & up keeping of lab & workshop equipment.