

TRIPURA GAZETTE



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**PART--I-- Orders and Notifications by the Government of Tripura,
The High Court, Government Treasury etc.**

**GOVERNMENT OF TRIPURA
DEPARTMENT OF POWER
AGARTALA: TRIPURA**

No. F.6 (3)/INS/E/TELB/2024-25/300-307

Dated, Agartala, the 14th May, 2024

NOTIFICATION

WHEREAS, in exercise of the powers conferred under **Regulation 29** of the **Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010**, the State Government had promulgated **The Tripura Electrical Licensing (Contractors/ Supervisors/ Workman) Procedure, 2019** (TELP-2019), for the purpose of prescribing the procedure for issuing License and permit to the Electrical Contractors, Supervisors and Workman by Notification No. F.6 (3)/INS/E/TELB/2019-20/24-29 dated 24/04/2019:

AND WHEREAS, it is now expedient to introduce a new syllabus for update technological development in the field of Electrical Engineering / Power Industry for matching the present day requirement of Electrical Technology:

NOW THEREFORE, the Governor of Tripura in exercise of its power under **Regulation 29** of the **Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010** is hereby pleased to amend the TELP-2019 as follows:-

1. Short title and commencement:-

- These may be called **The Tripura Electrical Licensing (Contractors/ Supervisors/ Workman) (Amendment) Procedure, 2024**.
- They shall be deemed to have come into force on and from the date of their notification in the Official Gazette.

2. Amendment of Clause 21(c):-

In the second table appended under sub clause (c) of clause 21 of TELP-2019, after serial no. (f) a new serial no. (g) will be inserted with other contents, as follows:-

“

Certificate for		Parts Compulsory
(g)	Mining Installations	I, II, IV, VI (A), VII (A) & XII.

”

3. Part-I of clause 21 of TELP-2019 will be substituted with the following:-

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PART - I

ELEMENTARY PRINCIPLES

Electrical Properties of materials:-

General idea about safety, types of fire extinguisher and use, safety sign, knowledge of tools, types of wires, joints and use, solders, flux, soldering, brazing and their uses. Conductors, Semiconductors and Insulators and their relative merits. The effect of commonly occurring conditions such as moistures, heat etc. conditions of materials:- Magnetization by electric currents, electromagnets and their application. Conductors, bare and insulated. The resistance and safe

current carrying capacity, calculation of sizes of conductors for connected load with due regard to heating and voltage drop, Electrical parameters & Electrical symbols.

Basic concept of Illumination, Solid angle, Luminous Flux, Lumen, Luminous Intensity, Candela, Candle Power, Illuminance, Lux or Metre-candle, Brightness or Luminance, Luminous Efficiency, Laws of Illumination.

Purpose of Electrical control gear, switch, fuse, miniature circuit breaker, residual current circuit breaker, earth leakage circuit breaker, moulded case circuit breaker, isolator. Ranges of Low, Medium, High and Extra High Voltage.

Electrical circuit, Power: Active & Reactive, Power factor and its method of improvement. Series/Parallel connections, Ohm's law, Specific resistance, Laws of resistance, Insulation resistance. Application of Ohm's law to simple methods of ascertaining resistance, voltage and current. Kirchoff's law, Lenz's law and Faradays law of electromagnetic induction and their applications. Skin effect

Electrical measurements and measuring instruments such as Ammeter, Voltmeter, Wattmeter, Energy Meter, Insulation Tester, Earth Tester, Current Transformer, Power Transformer. Electric shock:- different method of electric shock, precaution for electric shock, Action to be taken, method and duration of treatment in cases, of persons suffering from electric shock, Concepts of power and lighting circuit diagram in domestic, industrial & commercial buildings.

Purpose of Earthing: Types of Earth electrodes, Earth lead & earth continuity conductor, leakage to Earth & Protective devices

Grades and classes of cables :-

Their suitability of different kinds of installation works. The installation and systematic testing of cables for continuity, leakage, insulation resistance and the testing of connections.

A general knowledge of **C.E.A. (Measures Relating To Safety and Electric Supply) Regulations, 2010** as applicable to installation work of this part.

4. Part-II of clause 21 of TELP-2019 will be substituted with the following:-

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PART – II

WIRING FOR SYSTEMS UPTO 650 VOLTS.

Estimation of total load of a system and rating of Main Switch. Distribution through Sub-mains, Distribution Boards and Sub-circuits.

Voltage drop in a distribution system of a Medium Voltage installation and its limits. Balancing of loads, Limit of load in a single circuit.

Types and size of board, casing, capping, PVC pipes, GI pipes, gutkha and screw, their uses. Types of wiring and their uses.

Types and sizes of conductors, Standard wire gauges, effective cross-section. Solid conductor & Stranded conductor. Advantages of stranded conductor.

Current rating of wires and conductors and danger of using undersize conductor and oversize fuses. Earthing Practices, Statutory provisions of earthing, Types & Sizes of Earth connections.

Service Connection, Service line, Service connection at low voltage, Preparation of Estimate, Single Phase service connection estimate.

Connection of low pressure installation to medium pressure supply mains. Wiring installation including connections for power and other purposes but excluding that installation work specifically covered by **parts III & IV.**

A working knowledge of the **C.E.A (Measures Relating To Safety and Electric Supply) Regulations, 2010** as applicable to installation work of this part.

5. Part-III of clause 21 of TELP-2019 will be substituted with the following:-

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PART – III

DIRECT CURRENT (D.C.) APPARATUS UPTO 650 V.

Generators upto 650 volts:-

General concept of DC electrical machines, Principle of DC generator, use of armature, field coil, polarity, yoke, commutator, slip ring, brushes, laminated core, EMF equation of DC generator, armature reaction

D.C. series, shunt and compound wound types. Elementary theory, installation, operation and maintenance. Parallel running of machines and balancing of loads. Interpoles, Commutators and their maintenance. Carbon brushes, their adjustment and care, Methods of voltage regulation.

Motors upto 650 volts :-

D.C. series, shunt and compound wound types. Elementary theory, installation, operation and maintenance. Various methods of speed control and reversal of direction.

Cells and batteries :-

Primary Cells, Dry Cells, storage or secondary batteries or accumulators and their installations. Lead acid cell/battery (container, plates, separators, cover, electrolyte). Chemical reaction, Ratings, charging of batteries, Float, Boost & Trickle charging, Initial and subsequent charging of batteries, Checking of charged battery, Sulphation, Internal short circuiting, Charging circuits and their calculations, Series and parallel circuits. Installation and maintenance of Battery & battery charger. Use of Hydrometers.

Generator, Motor :-

Types of Enclosures, Earthing

Control Gear:-

The various types of switches, fuses, starters, controllers, regulators their uses and installation. Installations in general including portable appliances but excluding that installation work specifically covered by **Parts: IV, V & VI.**

A working knowledge of the **C.E.A (Measures Relating To Safety And Electric Supply) Regulations, 2010** as applicable to installation works of this part.

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6. Part-IV of clause 21 of TELP-2019 will be substituted with the following:-

“

PART – IV

ALTERNATING CURRENT (A.C.) APPARATUS UPTO 650 V.

Generators upto 650 volts:-

Alternating (A.C.) single and three phase, Elementary theory, installation, operation and maintenance. Parallel running of machines, rotary converters, power factor meter, frequency meters and synchroscopes. Methods of voltage and frequency control conditions and methods for synchronizing. Control Panels and synchronizing panels.

Motors upto 650 volts	<p>:- Alternating (A.C.) single and three phase, Induction & Synchronous Machines. Elementary theory, installation, operation and maintenance. Various methods of speed control and reversal of direction. Application of variable speed drive. Earthing Practices, Statutory provisions of earthing, Types & Sizes of Earth connections.</p>
Generator, Motor	<p>:- Types of Enclosures, Earthing, Generator Neutral Earthing</p>

Control Gear:-

The various types of switches, fuses, starters, controllers, regulators their uses and installation. Installation in general including portable appliances but exceeding that installation work specifically covered by **Parts – V & VI**.

A working knowledge of the **C.E.A (Measures Relating To Safety And Electric Supply) Regulations, 2010** as applicable to installation works of this part.

7. Part-V of clause 21 of TELP-2019 will be substituted with the following:-

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PART – V

INSTALLATIONS EXCEEDING 650 VOLTS.

Generators & Motors above	<p>:- Elementary theory, Installation, operation & maintenance 650 volts including H.V. Protective devices</p>
Transformers above	<p>:- Types of transformers and their uses. EMF equation transformer, process of transformer, testing of transformer, protective device of transformer Types, Methods of cooling, Vector Groups, Parallel operation, 650 volts (including High Voltage Installation (indoor & outdoor), Substation layout, Selection of High Voltage & Extra High Voltage) Cables, Neutral Earthing, Code of practice for selection, installation, maintenance & protection of Transformers</p>
Circuit Breakers above 650 volts (Including High Voltage & Extra High Voltage)	<p>:- Types, operation, Marking & Breaking current, Selection, Maintenance, Various types of Control gears</p>
Other High Voltage/ Extra High Voltage equipments	<p>:- Installation & maintenance in Plants and Switchyards</p>
Power factor improvement	<p>:- Capacitor bank, reactors, Installation, maintenance & protection of such Equipment</p>
Testing / Voltage	<p>:- Of High Voltage/ Extra High Voltage equipments prior to commissioning, Current transformers, Potential transformers, various types of protective relays</p>

Earthing Practices, Statutory provisions of earthing, Types & Sizes of Earth connections.

A working knowledge of the **C.E.A (Measures Relating To Safety And Electric Supply) Regulation, 2010** provisions of the as applicable to installation works of this part.

Note:-

A candidate must pass in **parts I, II, III & IV** before appearing in an examination for **Part-V**. Provided that they may appear for all the parts at same examination but will not be granted a certificate in **Part – V** should they fail in either **Part – I, II, III & IV**.

8. Part-VI of clause 21 of TELP-2019 will be substituted with the following:-

“

PART – VI

OVERHEAD LINES EXCEEDING 250 VOLTS.

For (A) Voltages upto 650 volts
For (B) Voltages upto 33000 volts
For (C) Voltages exceeding 33000 volts

Simple calculations and general principles of construction of low, medium and high voltage lines, General practical knowledge of erection under varying climatic conditions, Size of conductors, length of spans, sag, strength of poles, spacing of conductors, the uses of guys, stays, struts, guard wires, cross arms, insulators, brackets, safety devices, lightning conductors and arrestors, erection parameters of installations during road crossing, railway and river crossing. Effect of temperature, wind pressure, ice and snow, tension on wire. Testing of the installation, Fault location and earthing.

Service Connection, Service line, Service connection at low and medium voltage, High Voltage (11 KV) service connection, Preparation of Estimate, Service connection Estimate, Single Phase, Service connection Estimate, Three Phase, Estimate of 11 KV service connection.

A working knowledge of the **C.E.A. (Measures Relating To Safety And Electric Supply) Regulations, 2010** as applicable to installation works of this part.

9. Part-VII of clause 21 of TELP-2019 will be substituted with the following:-

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PART – VII

UNDERGROUND CABLES

For (A) Voltages upto 1100 volts
For (B) Voltages upto 33000 volts
For (C) Voltages exceeding 33000 volts

Poly Vinyl Chloride (P.V.C), Flame Retardant Low Smoke (FRLS), Cross-Linked Polyethylene (XLPE), Paper, Oil-filled, Gas-filled or any other type of cable as applicable for different classes of voltage. Selection of cables.

General practical knowledge of laying cables direct in ground, in duct, in trays and in pipes, unreeling from cable drum, handling, bending, jointing, plumbing, cable-end boxes, underground and above

ground joint boxes, junction boxes and distribution boxes and pillars, joint box compounds, melting of compound and filling of boxes with compound, Straight through joints, crimping and end termination for indoor and outdoor type. Testing of the installation, Fault location and earthing.

Service Connection, Service line, Service connection at low and medium voltage, High Voltage (11 KV) service connection, Preparation of Estimate, Service connection Estimate, Single Phase, Service connection Estimate, Three Phase, Estimate of 11 KV service connection.

A working knowledge of the **C.E.A. (Measures Relating To Safety And Electric Supply) Regulations, 2010** as applicable to installation works of this part.

10. Part-VIII of clause 21 of TELP-2019 will be substituted with the following:-

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PART – VIII

ELECTRICAL LIFTS & ESCALATORS

General principles, installation, maintenance and connection of Alternating Current (A.C.) and Direct Current (D.C.) motors upto 650 volts, various types of controllers / speed controllers and safety devices as used in lifts and escalators.

Precommissioning test & other protective devices including auto-rescue device, fire lift.

(N.B.:- **C.E.A (Measures Relating To Safety And Electric Supply) Regulations, 2010** does not extend beyond the electrical equipment installed and used in lifts).

"

11. Part-IX of clause 21 of TELP-2019 will be substituted with the following:-

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PART – IX

ELECTRIC SIGNS, ELECTRONIC DEVICES CONSERVATION OF ELECTRICAL ENERGY

Various types of Electric lamps, electric discharge lamps, Electric signs, luminous tubes, flashers, level of illumination, installation, connection, operation, controls and safety precautions to be taken.

Electronic Components :- Resistor, Capacitor, Inductor, Colour Codes.

Semi-conductor devices :- Diode, Transistor, Thyristors / Silicon Controlled Rectifier (SCR), Behaviour of diode, p-n-p & n-p-n transistors, SCR, Diac, Triac, Testing & applications.

Assembly and Testing of:- Electronic ballasts, Electric fan regulator, Full wave bridge rectifiers and Filter circuits, Poly phase Alternating Current(A.C) to Direct Current (D.C) Bridge rectifier, Inverter, Voltage stabilizer.

U.P.S. :- Components and Applications..

Computer :- Installation & special earthing requirement

Conservation of Electrical energy in residential, commercial and industrial installations. Various types of no-conventional electrical energy sources and their applications.

A thorough knowledge of the special instructions for such signs as issued under **C.E.A (Measures Relating To Safety And Electric Supply) Regulations, 2010.**

12. Part-X of clause 21 of TELP-2019 will be substituted with the following:-

“

PART – X

WIRING FOR SYSTEMS NOT EXCEEDING 250 VOLTS

Cleat, Poly Vinyl Chloride (P.V.C) casing, lead covered, conduit and armoured cable including Fire Retardant Low Smoke (FRLS) cable, main switches and cut-outs, distribution boards and installation of switches and pre-commissioning test.

Low voltage electrical appliances of common use such as heaters, cookers, small motors for pumps, refrigerators, electric bells and indicators works of electric supply lines whether portable or otherwise and their installations, Earthing, protective devices such as MCB, RCCB, ELCB, MCCB & Isolators .

Low voltage overhead lines :- General principles of construction, type of poles, types of insulators and their uses, stay set complete, types of ACSR size and uses, length of spans, spacing of conductors, height of conductors, cross-arms, guard wires, safety devices, Earthing, lightning conductors and arrestors. Pre-commissioning tests.

Estimating Electrical Wiring of a building, Procedure of Estimating, Plan and specification, Electrical schedule, Load and no. of circuits, Wiring Plan, Size of cables, Sub-circuit schedule, Material calculations.

A working knowledge of the **C.E.A. (Measures Relating To Safety And Electric Supply) Regulation, 2010** as applicable to installation works of this part.

”

13. Part-XI of clause 21 of TELP-2019 will be substituted with the following:-

“

PART – XI

TRANSFORMER INSTALLATION EXCEEDING 650 VOLTS.

Transformer :-

General principle, elementary calculations, name plate details as per Indian Standard (I.S.) Codes of practice, various types of uses, installation, wiring connections, testing, operation, winding connections, phasing out and parallel operations, off-load tap changing, installation & maintenance of outdoor & indoor type transformer including load break switch fuse unit, isolator and lighting arrestors, protection, safety precautions, equipment & neutral earthing.

A working knowledge of the **C.E.A. (Measures Relating To Safety And Electric Supply) Regulations, 2010** as applicable to installation works of this part.

Note:- A candidate must pass in parts **I & II** before appearing in examination for **Part-XI** provided that he may appear for all parts at the same examination but will not be granted a certificate in **Part-XI** should he fail in either of parts **I & II**.

14. After Part-XI of clause 21 of TELP-2019, a new part- XII will be inserted as follows:-

PART-XII

MINING INSTALLATIONS

(Regulations as required by the department of Mines, Govt. of India)

Candidates for this part must have a minimum of two years experience in electrical installation o mines

- Type of power and trailing cable used both in underground and open cast mines. Maintenance practice and cable jointing.
- Basic knowledge on Electrical shovel, dragline and field switches.
- Installation and maintenance of electrical winder, haulage, pump and electrical equipments in Coal cutting machine, loader, conveyor, road header, shearer and continuous miner, drill machine and their gate and box.
- Flameproof (FLP), intrinsically safe circuit, voltage limits for surface and underground installation, specific provision for gassy mines.
- General familiarity of Central Electricity Authority Regulations and Chapter IX related to mines.

Compulsory Group of Parts **I, II, IV, VI(A) & VII(A)** for Part **XII**

A candidate must pass in Parts **I, II, IV, VI(A) & VII(A)** before appearing in an examination for part **XII**.

Note: (1) Those candidates who desire a certificate for supervising high pressure work below ground must also qualify in Part **V**.

Note: (2) Any person who holds a certificate for Mining Installations (Below ground) shall also be entitled to supervise surface installations of the nature covered by the syllabus for the parts in which he/she was qualified.

Note: (3) For the supervision of Electrical installation below ground in gassy mines, persons who hold certificates for supervising electrical installations in mines below ground shall have their certificates endorsed for supervising such installations in " gassy mines" if they can produce satisfactory evidence that they have a minimum of six months' practical experience of electrical installation in "gassy mines" underground.


(U. Sinha)
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Government of Tripura
Power Department