Field Assistant and Other Technical Posts

1. Core Subject Knowledge (Technical)

This is the most critical part of the exam, as it tests your knowledge specific to the field of electrical engineering and basic mechanical concepts, particularly relevant for roles that involve electrical installations and maintenance.

A. Electrical Concepts and Basics

- **Basic Electrical Principles**:
  - Ohm's Law, Kirchhoff's Laws, and their applications.
  - Series and parallel circuits, current, voltage, and resistance concepts.
  - Power calculations: power, energy, and load distribution.
- **Electrical Machines**:
  - Transformers: single-phase and three-phase transformers, working principles, and basic calculations.
  - DC Motors and Generators: types (shunt, series, compound), operating principles, applications, and maintenance.
  - AC Machines: Induction motors (single-phase, three-phase), synchronous motors, starting methods, and applications.
- **Power Systems and Distribution**:
  - Basics of power generation: thermal, hydro, nuclear, and renewable energy sources.
  - Transmission lines: conductor types, insulators, and line constants.
  - Distribution systems, AC/DC transmission, substations, and feeders.
- **Electrical Measurements and Instruments**:
  - Measurement devices: voltmeters, ammeters, wattmeters, energy meters, and multimeters.
  - Concepts of accuracy, precision, error analysis, and instrument calibration.
- **Wiring and Lighting Systems**:
  - Wiring types: conduit, casing and capping, and underground wiring methods.

    - Basics of lighting systems, including types of lighting (incandescent, LED, fluorescent) and basic installation techniques.
- **Switchgear and Protection**:
    - Circuit breakers, relays, fuses, and earthing systems.
    - Protective devices: MCBs, MCCBs, and ELCBs.
    - Safety measures in electrical installations, grounding practices, and earthing.

B. Basic Electronics

- **Semiconductors and Diodes**: Basic semiconductor concepts, types of diodes, rectifiers, and applications in electrical circuits.
- **Transistors and Amplifiers**: Types of transistors, working principles, and simple amplifier circuits.
- **Digital Electronics**: Logic gates, basic circuits, flip-flops, and counters.

C. Mechanical Basics (For Multi-Disciplinary Technical Posts)

- **Simple Machines**: Levers, pulleys, gears, and screws, and their applications in electrical work.
- **Pumps and Motors**: Basic working principles and types, especially those relevant to electrical roles.
- **Fitting and Assembly**: Tools, equipment handling, and basic assembly skills.

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2. General Knowledge and Current Affairs

This section tests awareness in general knowledge with a focus on Tamil Nadu, Indian history, geography, and energy sector-related events.

A. Current Affairs:

- Recent developments in science, technology, politics, and environment, especially in Tamil Nadu.
- Updates on the power sector, renewable energy policies, and state initiatives.

B. General Science:

- Physics: Basic concepts of electricity, magnetism, and energy.
- Chemistry: Knowledge of conductors, insulators, and chemical safety in the electrical field.
- Environmental Science: Basics of pollution, sustainable development, and energy conservation.

C. Indian History and Geography:

- Important events in Indian history, especially in Tamil Nadu's role in the Indian independence movement.
- Geography basics, including major rivers, mountains, and physical geography of Tamil Nadu.

D. Economics and Power Sector:

- Indian economy basics with a focus on the power sector.
- Tamil Nadu government schemes related to rural electrification and energy conservation.

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3. Aptitude and Mental Ability

The Aptitude and Mental Ability section assesses your basic arithmetic, logical reasoning, and problem-solving abilities.

A. Numerical Ability:

- **Arithmetic**: Simplification, percentages, fractions, ratios, averages, and profits and loss.
- **Time and Distance**: Calculations involving speed, time, and distance.
- **Simple and Compound Interest**: Basic interest calculations.

B. Logical Reasoning:

- **Series and Patterns**: Number series, letter series, and identifying patterns.
- **Analogies**: Recognizing relationships between words or objects.
- **Odd-One-Out**: Identifying the item that doesn't fit within a series or group.

C. Spatial and Mechanical Reasoning:

- **Mechanical Reasoning**: Basic questions on pulleys, gears, levers, and tools.
- **Spatial Ability**: Visualizing 2D and 3D shapes, and matching shapes to assess spatial skills.

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4. Physical Test (Field Assistant Post Only)

For the Field Assistant role, candidates are expected to pass a physical test to ensure they can handle the physical demands of the job. The physical test generally includes:

- **Pole Climbing**: Climbing up and down electrical poles within a set time limit, often with safety equipment.
- **Lifting and Carrying Weights**: Candidates may be required to carry loads over short distances to assess strength.
- **Endurance Tests**: Physical endurance activities to test fitness for fieldwork.