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# ITI Electrician Theory

NSQF Level-4 Textbook

by G.V. Ramana Murthy and K. Mehta

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# Preface to Latest (NSQF Level-4 Compliant) Edition

Directorate General of Training (DGT) under the Ministry of Skill Development & Entrepreneurship, being the apex organization for development and coordination of vocational training at the national level, undertakes steps from time to time to improve its various aspects in line with changing market and industry requirements.

Electrician trade has been made NSQF Level 4 compliant under Power sector. Electrician is one among the top couple of most popular trades delivered nationwide through a large network of Industrial Training Institutes. The duration of training for this trade is two years. During this duration the trainees are trained on subjects Professional Skill, Professional Knowledge, Engineering Drawing, Workshop Science & Calculation and Employability Skills.

In keeping these latest changes, this **3-in-1** volume has been updated to be fully in line with the latest curriculum of Electrician trade (NSQF Level-4). It contains complete and comprehensive well illustrated theory matter in Modular pattern (fully according to the latest prescribed syllabus). New topics/Module viz. **Automatic Meter Reading**, etc. and **EV Scenario in India** have been incorporated in this new revised edition as per new additions in the latest syllabus. A rich collection of multiple choice questions on All India Trade Test pattern with **Latest exam paper questions have been incorporated in the Latest edition for benefit of trainees.**

A big set of 12 **Revised NIMI Pattern** Model Papers (6 each for 1st and 2nd Year) have been given as a unique feature of this book which will help prepare trainees for the Annual A.I.T.T. exams.

To help trainees take A.I.T.T. still more confidently, they can draw benefit **absolutely free of cost**, of 50+ hours' video solutions (with explanation) of all MCQs given in this book – a novel and unique feature provided with this edition.

It is firmly believed that this **3-in-1** volume viz.,

1. **Trade Theory**
2. **Assignment (MCQs)**
3. **Revised NIMI-pattern Model Papers (Solved) for Annual A.I.T.T. Exam**

will be of great help to trainees to learn and understand theory subject of Electrician trade and also equip them to confidently face All Indian Trade Test. We welcome suggestions from our esteemed readers that would help us make further improvements in subsequent editions.

– Authors

## *Dedicated to my parents*



**Smt. Gonella Venkata Lakshmi**

(22-08-1930 to 08-12-2011)

*Noble, Kind, Broad-minded, Large-hearted,  
Symbol of sacrifice*

*who, besides up-bring her own children in hard conditions and despite being widowed at early stage of her life, helped many poor, economically backward, with food, clothes, school fees, irrespective of cast and religion.*

**Shri. Gonella Suryanarayana Murthy**

(1916–1960)

*He sacrificed his life for uplifting of school students providing financial assistance, food and clothes, besides giving free coaching to vocational trainees.*

**(G.V. Ramana Murthy)**



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**House Service Connections and Wiring Layout:** *Service Line or Service Mains, Types of Service Mains, Underground Service Mains, Overhead Service Mains, Position of Main Board, Position of socket outlets and switches, Height At Which The Lamps Must Be Hung, Drawing Room, Dining Room, Bed Room lights, Kitchen Lights, Bath Room lights, Stair case lights, Various circuit*

*Diagrams, Socket outlet controlled by one pole switch, Fault Finding and Trouble shooting of Domestic Electrical Appliances, Over Load Fault, Short Circuit Fault, Earth Fault.*

**Assignment/Test—Solved**

• Multiple Choice Questions • Key **250–257**

**13. CIRCUIT BREAKERS ..... 258–264**

*Operating Principle of Circuit Breakers, Classification of Circuit Breakers, Oil Circuit Breaker (OCB), Air Blast Circuit Breakers (ABCB), Air-Break Circuit Breaker (ACB), Miniature Circuit Breakers (MCBs), Moulded Case Circuit Breaker (MCCB), Earth Leakage Circuit Breaker (ELCB).*

**Assignment/Test—Solved**

• Multiple Choice Questions • Key **262–264**

**14. EV SCENARIO IN INDIA ..... 265–268**

*EV Charging, EV Charging Stations.*

**Assignment/Test—Solved**

• Multiple Choice Questions • Key **268**

**Appendix : 2nd Year Rev. Model Papers 1 to 6 (NIMI-pattern – NSQF Level – 4) ... 269–290**

**Appendix : Useful Tables ..... (i–iv)**