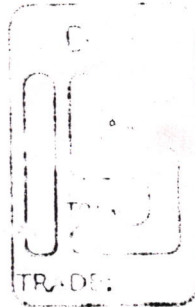


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(b)

SYLLABUS FOR

(TRADE NAME) : ELECTRICAL TECHNICIAN

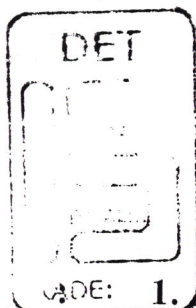


**UNDER CODE OF REGULATIONS FOR
INDUSTRIAL SCHOOLS**

AS APPROVED BY DEPARTMENT OF
EMPLOYMENT AND TRAINING,
CHEPAUK, CHENNAI - 600 065.

..... 2005

LIST OF COMMITTEE MEMBERS FOR THE
TRADE OF ELECTRICAL TECHNICIAN



1. Members and Experts

- Sri. T. SUNDARARAJ**
Regional Joint Director
Guindy, Chennai - 32.
- 2. Sri. P. DWARAKA**
Assistant Director
Guindy, Chennai - 32.
- 3. Sri. S. RADHAKRISHNAN**
Principal
Madras Industrial School,
Chennai - 44.
- 4. Sri. C.R. SURESH**
T.O. Electrical Department
Kumaran Industrial School,
Chennai - 44.
- 5. Sri. M.C. RAJAKUMAR**
Tamil Nadu Industrial School,
No. 43, M.K.N. Road,
Guindy, Chennai - 32.

COURSE DETAILS 3

Name of Trade : **ELECTRICAL TECHNICIAN**

Qualification : **10TH PASS / FAIL**

Age : **14-40 Years**

Duration : **1 Year**

Number of Trainees : **20**

Number of Practical hours : **32 hrs. per week**

Number of Theory Hours : **8 hrs. per week**

Number of Workshop Calculation hours : **2 hrs. per week.**

Number of Engineering Drawing hours : **2 hrs. per week**

Space Required

Workshop : **400 sq.foot**

ClassRoom : **200 sq.foot**

Power Required in KW : **3 k.w.**

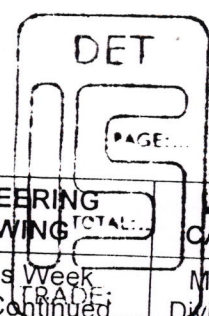


DRAFT SYLLABUS FOR THE TRADE OF ELECTRICAL TECHNICIAN ONE YEAR UNDER INDUSTRIAL SCHOOL PATTERN

Duration : One Year

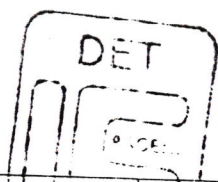
WEEK No.	TRADE THEORY	TRADE PRACTICAL	ENGINEERING DRAWING	WORKSHOP CALCULATION
1.	Familiarization with Trade and Importance of Trade.	Measuring the various objects with scale.	-	-
2.	Duties and Responsibilities of Trainees and Safety measures to be observed.	Demonstration of Elementary First-Aid and Artificial Respiration & Safety Measures.	Introduction of Engineering Drawing Materials and their uses.	Classifications of Units – C.G.S. M.K.S. & F.P.S. Systems.
3.	Study about Matter Atoms Structure and Electrons Theory Law of Conservation of Energy.	Demonstration of Hand Tools, Identification of Simple Types Screws, Nuts, Bolts, Clamps and Rivets.	Lettering such as Small, Capital Inclined and Number Practice.	Conversion of Units, Metric & British Systems and Related Probiems.
4.	Fundamental of Electricity & Sources of Electricity.	Skinning the Cables and Joint Practice of Single Strand Wire under various sizes (1/18, 3/20, 7/16 and 7/20)	- do -	- do -
5.	Effects of Electricity : Current, Types of Electric Circuit, Electrical Terms and Units. Study about Generation of Electricity and its Types.	Joining Multistrand Wire Joints (Britania, Tee, Western Union) with Bare Copper Wire.	Sketching Plain Figures of Simple Solids.	- do -
6.	Study about Soldering and Brazing, Types of Solder and their Fluxes and Uses.	Soldering, Wire Joints and Serial Lamps Setting.	- do -	Addition, Subtraction Both Fractions, Type Decimal and Natural Numbers.
7.	Study about Conductors, Insulators, Semi-Conductors, Wire and Cables.	Practice given for using Crimping Tool to Fix Different Lugs to the Wires & Cables.	Introduction to Draw Different Types of Lines and Electrical Symbols.	- do -
8.	Study about Measuring Instruments such as Vernier Caliper, Screw Gauge & S.W.G. Plate.	To measure various Objects and Wire Size with Measuring Instrument & Gauges.	Free Hand Sketch of General Tools used for Electrical Wiring.	- do -

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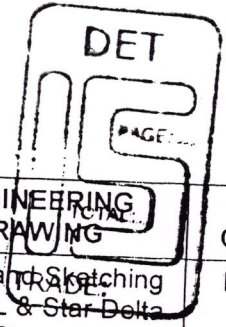
WEEK No.	TRADE THEORY	TRADE PRACTICAL	ENGINEERING DRAWING	WORKSHOP CALCULATION
9.	Study about Electrical Accessories such as Types of Switches, Sockets, Plug, Holders.	Demonstration of Electrical Accessories Mounting on the Test Board.	Previous Week Chapter Continued	Multiplication & Division of Natural Numbers, Fractions.
MONTHLY TEST TO BE CONDUCTED FOR THE PREVIOUS WEEKS SUBJECTS TAUGHT Test from Theory, Practical, Drawing and Workshop Calculation				
10.	Study about Hand Drilling M/c, Drill Bits, Stock & Dies, Files & Taps and Dies.	Drilling, Filing and Threading (Internal & External).	Free Hand Sketch of Wire Joints.	- do -
11.	Study about Resistances and their Circuits Type. OHMS Law, Kirchhoffs Law, Laws of Resistance.	Verification of Ohm's Law & Kirchoff's Law etc., with variable Rheostat and other Electrical Instrument Fixed.	Free Hand Sketch of Calibration Tools such as Vernier S.W.G, Screw Gauge.	- do -
12.	Definitions of Work Power, Energy with Numerical Problems.	- do -	Free Hand Sketches of MC & MI Instrument (Internal Connections).	L.C.M, Reciprocal & Inverse of Fractional Works.
13. & 14.	Study about Cells & Batteries (Primary and Secondary). Troubles and Remedies Charging Methods.	Dismantling of Battery and Charging Methods.	Free Hand Sketch of Bolts, Nuts & Screws.	Ascending and Descending Order of Ordinary Numbers and Fractions.
15. & 16.	Study about Magnet and their Properties, Types, Uses, Faradays Law & Fleming's Rule. Electro Magnet	Tracing the Magnetic Field of a Bar Magnet by using Magnetic Needle.	- do -	- do -
17.	Study about Fuses, Advantages, Uses, Types Fusing Factor.	To Prepare Test Board (Series & Parallel) to check the continuity of Electrical Appliances.	Free Hand Sketches of Megger, Wattmeter (Internal Connection).	Simple Shop Problems related to Fractions and Decimal Fractions.
18. & 19.	Study about Illumination & Incandescent Lamps, Fluorescent, Vapour	To Connect Lamps (Series and Parallel) and Vapour Lamps.	Free Hand Sketch of Incandescent, Mercury Vapour (High Pressure, Low Pressure).	Simple Shop Problems related to Fractions and Decimal Fractions.
20. & 21.	Study about I.S.I. Rules for Electrical wiring for Single Phase / Three Phase and Types of Wiring. Estimating & Costing for the above Wiring.	Wiring on Board by using Different Switches, Holders, Sockets (Godown Wiring, Staircase Wiring etc..).	Wiring Diagram of Godown Wiring, Staircase Wiring, etc.,	Squares & Square Roots.

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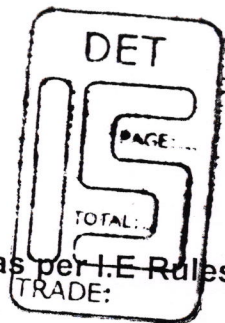
WEEK No.	TRADE THEORY	TRADE PRACTICAL	ENGINEERING DRAWING	WORKSHOP CALCULATION
22.	Study about the Principle of D.C. Generator, Their Parts & Types of Generator.	Practice given for Wiring on Board by using Different Switches, Holders, Sockets. (Godown Wiring, Staircase Wiring, etc.)	Drawing a Single Phase Wiring connected with Main Switch and Motor.	Mass, Weight Specific Gravity Density & Relate Problems.
23. & 24.	Study about Alternator and Working Principles and their Uses Synchronization of Alternators.	- do -	Drawing a Single Phase Wiring connected with Main Switch and Motor.	- do -
25.	Study about the A.C. & D.C. and their Differences and Uses.	Three Phase Wiring Practical with Necessary Accessories connected to Three Phase Motor.	Drawing Three Phase Wiring connected with Three Phase Motor Starter, Main Switch.	Simple Problems in Percentage.
26. & 27.	Study about Moving Iron Volt Meter and Ammeter. Energy Meter	Three Phase Wiring Practical Connected with Voltmeter, Ammeter, Energy Meter at Different Loads.	Drawing Three Phase Wiring connected with Three Phase Motor Starter, Main Switch.	Simple Problems in Percentage.
28.	Study about Megger, Multimeter.	- do -	Drawing the Constructional Part of D.O.L & Star & Delta Starter.	Work, Power, Energy & Related Problems.
29.	Study about Earthing (Pipe Earthing, Plate Earthing 2 Uses).	- do -	- do -	- do -
30. & 31. & 32.	Study about Types of Domestic Appliances such as Heater, Iron Box and Mixie, Wet Grinder & Immersion Heater, Hot Plate.	Practical to Test Dismantling & Assembling & Maintenance Work of Domestic Appliances.	Drawing the Isometric Blocks.	Solve for one unknown, two unknown Simultaneous Equation.
33.	Study about Single Phase / Three Phase Advantage of Polyphase.	- do -	Free Hand Sketch of Plate, Pipe Earthing.	- do -
34. & 35.	Study of Transformer, Parts of Transformer Types, Working Principle.	Open Circuit / Short Circuit Test of a Transformer.	Orthographic views simple solids.	Specific Resistance Parallel and Series Connection of Resistance.

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WEEK No.	TRADE THEORY	TRADE PRACTICAL	ENGINEERING DRAWING	WORKSHOP CALCULATION
36. & 37.	Study about DC Motor and its Types with Necessary Starter.	Using Three Point Starter to Run a DC Motor.	Free Hand Sketching of D.O.L & Star Delta Starter	Previous Week Chapter Continued.
38. 39. 40. 41. & 42.	Study about AC Motor Single Phase / Three Phase with Necessary Starter such as D.O.L & Star and Delta.	Practical Work to Connect Ceiling Fan, Table Fan, Single Phase Motor, Three Phase Motor with all Necessary Starter.	Orthographic Views.	Simple Electrical Problems.
43. & 48.	Types of Winding & Calculation.	Fan & Motor Rewinding.	Different Types of Winding Diagrams	- do -
From 49 th Week to 52 nd Week Previous Weeks Syllabus Revision & Test.				

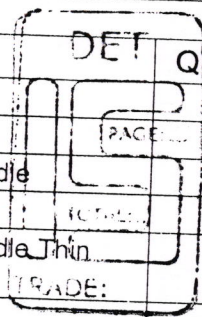
ACHIEVEMENTS



- Carryout Domestic Wiring for Lighting and Power as per I.E Rules and Test
- Carryout Battery Charging.
- Connect, Run, Test and Rectify the fault of Domestic Electrical Appliances.
- Carryout Winding of AC Fan Motor, Single Phase Motor / Three Phase Motor.
- Carryout to get Practice to Maintain Fault finding servicing of pumps.
- Carryout Commercial Lighting for decoration etc.,

LIST OF TOOLS AND EQUIPMENTS FOR THE TRADE OF ELECTRICAL TECHNICIAN FOR A BATCH OF 20 TRAINEES

TOOL KIT		
S. No.	DESCRIPTION	QTY / PER UNIT
1.	Plier Insulated (150mm) 6"	5
2.	Rule Steel (300mm) 12"	5
3.	Electrician Screw Driver (250mm) Thin Stem insulated Handle	5
4.	Heavy Duty Screw Driver (200mm)	5
5.	Electrician Connector Screw Driver (150mm) Insulated Handle Thin Stem	5
6.	Screw Driver 150mm Insulated Handle	5
7.	Electrician Tester	5
8.	Hammer Ball Peen (0.75kg) with Handle	5
9.	Hammer Cross Peen 115 gross with Handle	5
10.	Plier Side Cutting 150mm	5
11.	Gimlet 6mm	5
12.	Nose Plier 150mm	5
SHOP TOOLS, INSTRUMENTS & MACHINERY		
1.	Firmer Chisel Wood 12mm	2 Nos. ✓
2.	Blow Lamp 0.5 Litre	1 No. ✓
3.	Hand Drilling 7 / C to 12mm	1 No. ✓
4.	Hack Saw Frame Flat	2 Nos. ✓
5.	Electric Drill Machine (0 - 12mm)	1 No.
6.	Allen Key all Sizes	1 Set
7.	Greese Gun	1 No.
8.	Wire Stripper	1 No.
9.	Standard Wire Gauge Plate	1 No.
10.	Double End Spanner all Sizes	1 Set
11.	Ring Spanner all Sizes	1 Set
12.	Pulley Puller	1 No.
13.	Bearing Puller	1 No.
14.	Bench vice fitted with work table (Vices -- 2 Nos.)	1 No.
15.	Vice Hand 50mm Jaw	1 No.
16.	Megger 500 Volts	1 No.
17.	Multimeter 0 to 1000 M - Ohms 2.5 to 500 Volt	1 No.
18.	Spring Balance 0 to 5 Kg	1 No.
19.	Crimping Tool	1 Set
20.	Wooden Mallet 500 gms	2 Nos. ✓
21.	Try Square 150mm Blade	2 Nos.
22.	Drill Bit SS all sizes from (3mm to 12mm)	1 Set ✓
23.	Flat File 150mm Rough	2 Nos.
24.	Flat File 250mm Rough	2 Nos.



Contd....

S. No.	DESCRIPTION	QTY / PER UNIT
25.	Flat File Smooth 250mm	2 Nos.
26.	Techno meter as Revolution Counter	1 No.
27.	AC Ammeter 1 MA to 500 MA	1 No.
28.	AC Ammeter 1 Amp to 30 Amps	1 No.
29.	AC Single Phase Energy Meter	1 No.
30.	AC Three Phase Energy Meter	1 No.
31.	AC Voltmeter 1 to 100 volts and 1 to 500 volts	1 No. each
32.	Variable Rheostat	1 No.
33.	Voltage Stabilizer from 1 volt to 24 volts	1 No.
34.	Transformer (Single Phase)	1 No.
35.	Soldering Iron 225 gms, 125 watts and 150 watts	2 Nos.
36.	Outside and Inside Caliper (150mm)	2 Nos. each
37.	Stock and Dies Conduit	1 No.
38.	Tenon Saw 250mm	1 No.
INSTRUMENTS		
1.	D.O.L. Starter	1 No.
2.	Star & Delta Starter	1 No.
3.	Power Capacitor	1 No.
4.	ICDP Main Switch	2 Nos.
5.	ICDP Main Switch	2 Nos.
6.	Watt Meter 1000 watts	1 No.

MACHINERIES :

1.	Universal Motor	-	1 No.
2.	Shaded Pole Motor	-	1 No.
3.	D.C. Motor ½ HP to 1 HP (Any Type)	-	1 No.
4.	A.C. Motor Demonstration Purpose :		
	Single Phase (Specification 0.5 HP to 1 HP)	-	1 No. each
	Three Phase Motor (Specification to 1 HP to 3 HP)	-	1 No. each

DOMESTIC APPLIANCES :

1.	Electric Iron (1000 – 1200) watts	-	1 No.
2.	Mixie (Any Type)	-	1 No.
3.	Electric Heater 1000 – 1200 watts	-	1 No.

FOR WINDING WORK :

1.	Ceiling Fan, Table Fan, Single Phase Motor and Three Phase Motor	-	1 No. each
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12
30/06/13
Total

Industrial School:**Electrical Technician Trade revised Additional list of Tools & Equipment for (1+1) unit****I. Trainees Tool Kit / Trainee**

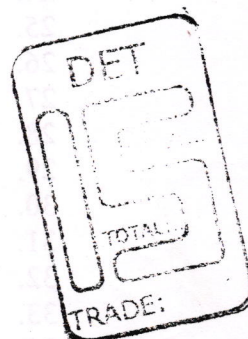
1. Side Cutter 150mm.	10 Nos
2. Center Punch 150mm X 9 mm	10 Nos
3. Electrician knife double bladed	10 Nos
4. Bradawl	10 Nos
5. Long nose plier 150mm.	10 Nos

II. Shop tools and Instruments / Unit

1. Spanner 150mm adjustable	-1No
2. Melting Pot	-1 No
3. Ladder	-2 Nos
4. Oil can	-1 No
5. Rawl plug tool kit	-3set
6. Wooden Mallet	-2 Nos
7. Standard wire gauge	-1No
8. File half round 200mm smooth	-2 Nos
9. Ammeter 0 to 5 A MI	-1 No
10. Ammeter 0 to 10 A MI	-1 No
11. Ammeter 0 to 1 A MC	-1 No
12. Steel Almirah 2.5 x 1.2 x 0.5M	-1 No

III. General tools Instruments & Machinery/ Shift

1. Pulley puller	-1 No
2. Bearing Puller	-1 No
3. D. E. Spanner set (standard size)	-2 set
4. Ring Spanner set (Standard size)	-2 set
5. Work Bench 2.5x 1.2 x 0.75 M	-2 Nos
6. Bench Grinder Motorised.	-1 No
7. Multimeter	-2 Nos
8. Frequency Meter	-1 No
9. Power factor meter	-1 No
10. Tong Tester	-1 No
11. Hand tacho Meter (revolution Counter)	-1 No
12. Megger 500 V	-1 No
13. Transformer 2 KVA 416/ 230 V	-1 No
14. Auto transformer varic 0 to 300 V 8 A	-1 No



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|-----------------------------------|---------|
| 15. Electrical hot plate 1500mm. | -1 No |
| 16. Electrical Kettle 1000W | -1 No |
| 17. Electrical iron Box Automatic | -1 No |
| 18. 3 pt. D. C. starter | -1 No |
| 19. 4 point D. C. Starter | -1 No |
| 20. Hand winding M/C | -1 set |
| 21. Fire Bucket | -2 No |
| 22. Nylon Hammer | -2 No |
| 23. Wire Cutter | -1 No |
| 24. Vernier Caliper 0-150mm | -1 No |
| 25. Taps & Dies | -1 No |
| 26. Pipe Vice | -1 No |
| 27. Wheat Stone bridge | -1 No |
| 28. Voltmeter 0.30 v Mc | -1 No |
| 29. Battery Charger | -1 No |
| 30. Lead Acid Battery | -1 No |
| 31. Cell tester | -1 No |
| 32. Battery Hydro Meter | -1 No |
| 33. Magnetic Compass needle | -1 No |
| 34. Bar Magnet | -1 No |
| 35. Wooden Wiring board 3'x2' | -20 Nos |
| 36. Phase Sequence meter | -1 No |
| 37. Earth megger | -1 No |

