

**MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION,  
MUMBAI.**

1	Name of Syllabus	<b>C. C. IN ELECTRIC EQUIPMENT ASSEMBLER (302108)</b>																																								
2	Max.Nos of Student	25 Students																																								
3	Duration	6 MONTHS																																								
4	Type	Part Time																																								
5	No Of Days / Week	6 Days																																								
6	No Of Hours /Days	4 hrs.																																								
7	Space Required	1) Workshop = 200 sqfeet 2) Class Room = 200 sqfeet TOTAL = 400 sqfeet																																								
8	Entry Qualification	7 <sup>th</sup> Pass																																								
9	Objective Of Syllabus/ introduction	Repairing & Maintenance of electric equipment will create self employment among the youth. To meet demand of skilled man power in relaters.																																								
10	Employment Opportunity	Servicing unit of electric equipment. Assembling shop of electrical/electric equipment can work in electrical/electronic industries as an assembler servicing Technician.																																								
11	Teacher's Qualification	C.C. in electrical from I.T.I																																								
12	Training System	<table><tr><th colspan="7">Training System Per Week</th></tr><tr><td>Theory</td><td></td><td>Practical</td><td></td><td>Total</td><td></td><td></td></tr><tr><td>6 hrs</td><td></td><td>18 hrs</td><td></td><td>24 hrs</td><td></td><td></td></tr></table>						Training System Per Week							Theory		Practical		Total			6 hrs		18 hrs		24 hrs																
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13	Exam System	<table><tr><th>Sr. No.</th><th>Paper Code</th><th>Name of Subject</th><th>TH/PR</th><th>Hours</th><th>Max. Marks</th><th>Mini. Marks</th></tr><tr><td>1</td><td>30210811</td><td>Basic Electricity</td><td>TH-I</td><td>3 hrs.</td><td>100</td><td>35</td></tr><tr><td>2</td><td>30210821</td><td>Basic Electricity</td><td>PR-I</td><td>3 hrs.</td><td>100</td><td>50</td></tr><tr><td>3</td><td>30210822</td><td>Appliance assembling &amp; repairing</td><td>PR-II</td><td>6 hrs.</td><td>200</td><td>100</td></tr><tr><td></td><td></td><td>Total</td><td></td><td></td><td>400</td><td>185</td></tr></table>						Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Mini. Marks	1	30210811	Basic Electricity	TH-I	3 hrs.	100	35	2	30210821	Basic Electricity	PR-I	3 hrs.	100	50	3	30210822	Appliance assembling & repairing	PR-II	6 hrs.	200	100			Total			400	185
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## THEORY – I, Basic Electricity

Sr.No.	Theory
1.	Hand Tools : Introduction of training & Institute, familiarization with the Institute. Organization of the Institute. Type of work & responsibility of trainees, Syllabus, safety precautions, elementary first aid. Identification uses & maintenance of piles, cutter, screw driver, drill machine, hammers, taps, soldering iron & disordering pumps etc.
2.	Electricity : - Introduction of Electricity batteries, voltage, current, Resistance, Power & Ohm's Law effects of electric current, Alternating Current :-A.C. induced voltage & current. Direct Currents :- Simple Leaclanche cell, laud acid cell, battery charger, series & parallel.
3.	Simple meters :- Voltmeter, Current/Ampere meter ohms meter (MultiMate) Simple & digital.
4.	Resistor :- Construction of different types of resistor wire wound resistor. The mister, Potentiometer series & parallel connection, color code of resistor, unit of resistor.
5.	Capacitor :- Unit capacity & capacitance of capacitor series & parallel connection of capacitors like gang, trimmer, mica, ceramic, paper, polyester, Electrolytic.
6.	Inductor & Transformer :- Coil concept, mutual induction self induction, series & Para ilea connection. Types of coil choke, antenna etc. types of core Air core-ferrite, core. Transformer, turns ratio, types of Transformer, step-up & step-down, power. Transformer.
7.	Semi-conductor :- Difference between semi - conductor & Germanium, Silicon, P & N Junction, Types if diode like Rectifier, varactor, Zener, LED,etc.
8.	Transistor :- Types PNP & NPN Transistor. Their pin configuration, base, emitter, Collector, function of Transistor & their different connection common base, common collector, common emitter. Use of heat sink.
9.	Study of single phase electric motors used in Domestic Appliances (Tractional horse Power motors)
10.	Study of different types of electrical equipments and appliances.
11	Electric appliances- Electric fan- Ceiling. Table Pedestal. Electric mixer grinder. Electric washing machine (Semi and automatic). Vaccum Cleaner. Electric room cooler. Water purifier. Microwave oven.. Their construction. Working principle. Possible faults and rectification. Dismantling and reassembly procedure safety precautions while handling these appliances.

## PRACTICAL – I Basic Electric

1	Introduction to working & equipment care. Introduction to electric supply system . Use of tools. Measuring instruments. Connection Simple fitting, drilling, the reding, different types of screw nuts, bolts, washers, clamps etc. soldering practice :
2	Identification of conductor insulator, voltage, current, power , ohms law. Tst & measure of A.C. Voltage & current. Test & measure of D.C.Voltage & Current.
3.	Rules of using MultiMate, Study of voltage current, Ohm meter. Study digital & simple meter.
4.	Study different types resistors (Wire wound), The mister, potentiometer resistor etc. Find out the value of resistor by color code method. Calculation of series & parallel resistance & identification of register. Testing of resistor by multi meter.
5.	Study different types of capacitors like variable gang capacitor. Trimmer, mica, ceramic paper. Polyester, electrolytic etc. Checking of capacitor parallel connection of capacitor.
6.	Checking of inductor coil by multi meter. Types of coils & their use. Checking of different types of transformer by multi meter (with supply & without supply) To study their uses.
7.	Testing of P.N. Junction diode by multi meter types of diode & their uses Jenner diode characterizes.
8.	Edification of leads of transistor testing of transistor by multi meter comparison of transistor. Common base, common collector emitter connections & their uses.
9.	To built voltage double (half & full wave) To built stabilizer /Screw weltered stabilizers. To built dual power supply. To built smps.

## PRACTICAL – II, APPLIANCE ASSEMBLING & REPERIRING

1.(A)	Study different types of electric bells – construction working, principle, testing Repairing possible faults and their rectification, Dismantling and reassembly procedure.
2.	Electric stove. Cooking range. Construction. Working principle. Testing, Repairing. Possible faults and their rectification. Dismantling and reassembly procedure.
3.	Electric Ram heater Reheated type working. Construction. Testing repairing,
(B)1.	Study of electrical fan-ceiling table. Exhaust. Pedestal – Construction working principle. Testing repairing Possible faults and their rectification Desertification and reassembly procedure.
2.	Electric mixer-construction. Working principle. Testing. Repairing. Possible faults and their rectification. Dismantling and reassembly procedure.
3.	Electric washing machine semi and automatic-construction. Working principle testing repairing possible fault and their rectification. Dismantling and reassembly procedure.
4.	Vacuum cleaner – construction working principle. Testing, Repairing faults and their rectification dismantling and reassembly procedure.
5.	Room cooler – construction working principle. Testing, Repairing faults and their rectification dismantling and reassembly procedure.
( C )	Project Report with cost analysis of any once appliance studied.



## STANDARD LIST OF TOOLS & EQUIPMENTS.

Sr. No.	Description	Quantity
1.	Trainees Kit	
2.	Long nose pliers insulated 150 mm	10
3	Diagonal cutter insulated 150 mm	10
4	Wire Snipper up to 6 mm	10
5	Tweezers insulated 100 mm.	10
6	Heat sink pliers.	10
7	Neon Tester 500 V	10
8	Knob Screw driver 100	10
9	Accrue driver driver 100 mm	10
10	Phillips elleighnment kit	10
11	Double blades electrician knife	10
12	Adjustable spanner or slide wrench 150 mm(not pipe wire ch)	10
13	De-soldering pump	10
14	Soldering iron 25 watts/230 V	10
15	Soldering iron 10 watts/230 V	10
16	Multi meter portable A.C./D.C.Voltage 1.5, 10, 50, 300, 500, 1000 volts. Current 10 MA, 100 MA, 500MA.& 10 Amps & 10 AMPS Resistance 10 K, 10 m etc.	10
	<u>Work ship tools and equipments.</u>	
17	First aid fit	1
18	Artificial respiration chart	4
19	Work benches 6' x 3' x 2 ½ ' (180 x 90 x 75 cm)	8
20	Rubber hand gloves pair	2 pairs
21	Steel rule 30 cm	2
22	Scriber 15 to 20 cm	4
23	Centre punch 10 cm	2
24	Hammer cross pain 11 gm with handle	2
25	Hammer Ball pain 220 gm with handle	2
26	Mallet hard inured	2
27	Gimlet 1.5 mm and 6 mm	2
28	Saw ten on 250 mm	2
29	Hand sheering metal cutting 25 cm	2
30	Brad owl mechanic double Covered Hand Drilling	2
31	Drill rage 10 mm	2
32	Electric drill machine portable 10 mm capacity with polishing and buffing facility.	2
33	Instrument file set, set of 12 piece (Middle file)	4 Sets each
34	Vice bench 50 Jaw & 100 mm.	

### BOOKS FOR REFERENCES

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| 1. Electrical engineering - M. L. Gupta                          | 1) Electricity                                 |
| 2. Basic electronics - Barnard Gnbe                              | 2) Register                                    |
| 3. Electronics simplified - Shalini marathe                      | 3) Capacitor                                   |
| 4. Principles of electronics M.L.Gupta                           | 4) Inductors and Transformers.                 |
| 5. Elementary Electronics engineering                            | 5) Transistors.                                |
| 6. Electronic projects – Efy                                     | 6) Diode                                       |
| 7. Electrical Appliances by book of various Anthores . a) Anwani | 7) Transistor repairing                        |
| 2) Bhatia  | 3) Electrical appliance hand book andel series |

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