Domestic Electrical Installation & Servicing Assistant

Course Name	Domestic Electrical Installation & Servicing Assistant
Sector	POWER
Course Code	PWR/2024/REES/333
Level	3
Occupation	Electrician
Job Description	Domestic Electrical Installation & Servicing Assistant plays a crucial role in ensuring the safe and efficient functioning of electrical systems, wiring and appliances, contributing to the overall functionality of domestic and residential environments.
Course Duration	Total Duration 360 Hrs (T- 90 hrs , P- 150 hrs , OJT- 60 hrs and ES-60 hrs)
Trainees' Entry Qualification	Grade 10 OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2 yrs relevant experience OR Previous relevant Qualification of NSQF Level 2 with one yr experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months experience
Trainers Qualification	BE/B.Tech in Electrical Engineering with 1Yr experience OR Diploma in Electrical Engineering with 2 Yrs experience. OR ITI in Electrician with 5 Yrs experience.

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs) [Multiple of 30]
1.	Tools and Testing instruments	Measure various electrical system parameters using necessary tools and equipment	10	20	30
2.	Wiring and Wiring accessories	Demonstrate electrical domestic wiring and various components of electrical appliances.	25	35	60
3.	Electrical drawings and circuit diagrams	Connect various electrical appliances as per connection diagram	10	20	30
4.	Maintenance of wiring and household electrical appliance	Troubleshoot faults in domestic wiring and household electrical appliances	30	60	90
5.	Health and safety	Apply working safety practices	15	15	30
6.	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	--	60	60
7.	Employability Skill	As per guided curriculum	60	--	60
		TOTAL:	150	210	360

SYLLABUS:

1. Module Name: Tools and Testing instruments

Outcome: Measure various electrical system parameters using necessary tools and equipment

Theory Content:

1.1 Tools:

i) Operation, ii) Diagram, iii) Application of the following tools:-

Plier Insulated, Plier Side Cutting, Screw Driver, Neon Tester, Hammer, Pincer, Chisel, Hand Drill Machine, hacksaw, knife, Allen Key, Grease Gun, Out Side Micrometer, Motorised Bench Grinder, Rawl plug tool and bit, Crimping Tool, Wire stripper, Try Square, Outside and Inside Divider Calliper, Pliers flat nose, Pliers round nose, Tweezers, Spanner, Gauge, wire imperial, file set, Soldering Iron.

1.2 Testing Instruments:

i) Working principle, ii) Connection diagram, iii) Application of the following instruments:-

Digital Multi Meter, Analog Multi Meter, A.C. & D.C. Voltmeter, A.C. & D.C. Ammeter, Wattmeter, DC Power Supply, Megger, Earth tester, Clamp meter, Blow lamp, Test lamp.

Practical Content: (Write a report on each practical)

1. Familiarization of different tools and their practical application.
2. Measurement of A.C, D.C voltage and current, resistance using digital multimeter / A.C. & D.C. Voltmeter / A.C. & D.C. Ammeter.
3. Measurement of power of 3-phase and single phase circuit using wattmeter.
4. Measurement of high resistance/ insulation resistance using Megger.
5. Measurement of Earth resistance using Earth tester.
6. Operation of D.C. power supply.
7. Use of clamp meter for measurement of current, voltage.
8. Use of test lamp.

Tools & Equipment needed : (For 30 Trainee)

Sl. No.	Item Description	Specification	Qty / Number
1.	Rule wooden	4 fold 60 mm	5 Nos.
2.	Screw driver	100 mm	5 Nos.
3.	Screw driver	150 mm	5 Nos.
4.	Heavy duty screw driver	200 mm	5 Nos.
5.	Electrician screw driver	250 mm thin stem insulated handle	5 Nos.
6.	Electrician connector, screw driver	100 mm insulated handle thin stem	5 Nos.
7.	Neon Tester	Standard	5 Nos.
8.	Plier insulated	150 mm	5 Nos.
9.	Plier side cutting	150 mm	5 Nos.
10.	Knife double bladed Electrician	Standard	5 Nos.
11.	Hammer, cross peen	115 grams with handle	5 Nos.
12.	Hammer ball peen	0.75 kg. With handle	5 Nos.
13.	Pincer	150 mm	5 Nos.
14.	Firmer chisel wood	12 mm	5 Nos.
15.	Saw tenon	250 mm	5 Nos.
16.	Steel rule	300 mm	5 Nos.
17.	C. Clamp	200 mm, 150 mm and 100 mm.	5 Nos.
18.	Spanner	150 mm adjustable 15 degree	5 Nos.
19.	Blow lamp	0.5 litre	5 Nos.
20.	Chisel	25 mm & 6 mm	5 Nos.
21.	Electric drill machine portable	6 mm capacity	5 Nos.
22.	Allen key	Standard	5 Nos.

23.	Oil can	0.12 litre	5 Nos.
24.	Grease gun	Standard	5 Nos.
25.	Outside micrometer	0 to 25 mm	5 Nos.
26.	Motorised bench grinder	Grinder motor: 0.55 KW , 0.75 HP, 3 Phase , 2800 RPM	5 Nos.
27.	Pulley puller	3 jaw	5 Nos.
28.	Bearing puller	as per SKF bearing no.	5 Nos.
29.	Crimping tool	Standard	5 Nos.
30.	Scissors blade	150 mm	5 Nos.
31.	Wire stripper	20 cm	5 Nos.
32.	Hacksaw frame	200 mm adjustable	5 Nos.
33.	Hacksaw frame	300 mm adjustable	5 Nos.
34.	Flat nose plier	100 mm	5 nos
35.	Tweezers	100 mm	5 nos.
36.	Spanner	D.E. metric standard set	5 Nos.
37.	Gauge, wire imperial	Standard	5 Nos.
38.	File flat	200 mm 2nd cut	6 nos.
39.	File half round	200 mm 2nd cut	5 nos.
40.	File round	200 mm 2nd cut	5 nos.
41.	File flat	150 rough	5 nos.
42.	File flat	250 mm smooth	5 nos.
43.	Soldering Iron	25 watt, 65 watt	5 nos. each
44.	Desoldering gun	Spring loaded vacuum style solder remover	5 nos.
45.	Growler	Input 230V AC, Armature dia 20-100mm	5 Nos.
46.	Digital multimeter	3 ½ digits, LCD display, 0-1000 M Ohms, 750 volt AC, 1000V DC, 10A	5 Nos.
47.	A.C. Voltmeter	MI type, 0-500V	5 Nos.
48.	D.C. Voltmeter	MC type, 0-500V	5 Nos.
49.	A.C. Ammeter	MI type, 0-10A	5 Nos.
50.	D.C. Ammeter	MC type, 0-10A	5 Nos.
51.	Wattmeter	Dynamometer type, 150-300-600V, 5-10A	5 Nos.
52.	Megger	500 Volt	5 Nos.
53.	Digital 4-wire Earth resistance tester	Earth Resistance 0-2Ω, 0-20Ω, 0-200Ω, 0-2kΩ. Voltage 0-300 AC	5 Nos.
54.	D.C. power supply	Dual channel, 0-30V, 2A	5 Nos.
55.	Clamp meter	AC/DC current 0-400A, AC/DC voltage 0-600V, Frequency 5-500Hz	5 Nos.

2. Module Name: Wiring and Wiring accessories

Outcome: Demonstrate electrical domestic wiring and various components of electrical appliances.

Theory Content:

2.1 Electrical wiring and materials:

Types of wiring system,Concept of Conduit wiring, Concept of Casing wiring, Schematic diagram of different wiring system. Accessories used for wiring– Main switch (ICDP, ICTP&N), Distribution board, Fuse, MCB, Cable, Conduit, Casing, Inspection box, One way Switch, Two way switch, Switch board, Plug Socket (only specification and use).

2.2 Earthing:

Concept of Earthing,requirement of earthing, types and method of earthing system – rod, pipe and plate earthing, Earthing of electrical installation, Earthing of electrical equipments.

2.3 Components of equipments:

2.3.1 Ceiling fan/ Pedestal fan: Capacitor, fan regulator (electrical & electronics), ceiling fan / Pedestal fan accessories.

2.3.2 Fluorescent lamp: Electromagnetic ballast, electronic ballast, starter, end connector, LED lamp, discharge lamp.

2.3.3 Electric iron: Coil, thermostat, cable size.

2.3.4 Geyser: Coil, thermostat, switch, cable size.

2.3.5 Room heater: Coil, insulators, thermostat, cable size.

2.3.6 Water pump motor: Single phase induction motor, 3-phase induction motor, DOL starter and its accessories, Star-delta starter and its accessories, cable size.

2.3.7 Inverter: Converter circuit, filter circuit, microcontroller.

2.3.8 Stabilizer: Servo motor, buck-boost transformer, auto transformer, control circuitry, motor driver.

2.3.9. Mixer grinder: Universal motor, overload.

Practical Content: (Write a report on each practical)

1. Familiarization of Conduit wiring with its accessories.
2. Familiarization of Casing wiring with its accessories.
3. Make a circuit using conduit wiring / casing wiring with one lamp point, one power plug and one fan point with regulator.
4. Familiarization of control components (electromagnetic contactor, thermal overload, push button switch) to run a single phase induction motor/ fan motor/ pump motor.
5. Familiarization of control components to run a 3-phase induction motor/ pump motor.
6. Familiarization of different parts of a Ceiling fan/ Pedestal fan.
7. Familiarization of different components of Fluorescent lamp.
8. Familiarization of different components of Electric iron.
9. Familiarization of different components of Geyser.
10. Familiarization of different components of Room heater.
11. Familiarization of different parts of Water pump motor.
12. Familiarization of different parts and components of Inverter.

13. Familiarization of different parts and components of Stabilizer.
14. Familiarization of different parts of Mixer grinder.

Tools & Equipment needed: (For 30 Trainee)

Sl. No.	Item Description	Specification	Qty / Number
1.	Conduit	PVC, 25 mm diameter, 2mm thick, for 1.5 mm^2 Al wire	20 Nos.
2.	Conduit bend	20 mm	20 Nos.
3.	Saddle	20 mm, metallic	50 Nos.
4.	Junction box	25 mm, two way	10 Nos.
5.	Socket	5 Pin, 240V, 16A	10 Nos.
6.	Contactor	3-phase, 440volt,16amp, 2NO+ 2NC auxiliary contacts	10 Nos.
7.	Thermal overload relay	3-phase, 0-15 A, 440V	10 Nos.
8.	Timer relay	On delay type, 240V, 1NO+1NC	10 Nos.
9.	Timer relay	Off delay type, 240V, 1NO+1NC	10 Nos.
10.	Push button switch	10A, 240V	10 Nos.
11.	M.C.B.	4 pole, 16 A, 440V	10 Nos.
12.	3-phase squirrel cage induction motor	3-phase 400 volt, 50 Hz, 2 HP, 1440 rpm	5 Nos.
13.	Single phase induction motor	1 HP, 230 volt, 50 Hz, capacitor run	5 Nos.
14.	D.O.L starter	3-phase, 400 V, 50 Hz, 5HP	5 Nos.
15.	Star-Delta starter manual	3-phase, 400 V, 50 Hz, 7.5HP	5 Nos.
16.	Star-Delta starter automatic	3-phase, 400 V, 50 Hz, 7.5HP	5 Nos.
17.	Fuse	Kit Kat type, 10A	10 Nos.
18.	Fuse	Cartridge type, 10A	10 Nos.
19.	Ceiling fan	900mm, 60W, 240V, 400rpm	5 Nos.
20.	Pedestal fan	400mm, 70W, 240V, 1350 rpm	5 Nos.
21.	Fluorescent lamp set with electronic ballast	36W, 240V	5 Nos.
22.	Fluorescent lamp set with electromagnetic ballast	36W, 240V	5 Nos.
23.	Electric iron	500W, 240V	5 Nos.
24.	Geyser	6 ltr, 240V	5 Nos.
25.	Water pump motor (single phase)	1HP, 240V, 50Hz	5 Nos.
26.	Water pump motor (3-phase)	1HP, 415V, 50Hz, 1440 rpm squirrel cage induction motor	5 Nos.
27.	Inverter	600VA, output 230V, 50Hz, battery - 12V, 130Ah, tubular type, 3hr backup time	5 Nos.
28.	Stabilizer	1000VA, 130 – 290V, 50Hz,	5 Nos.

		Auto/Manual selectable, efficiency better than 96%, continuous duty	
29.	Mixer grinder	500W, 18000 rpm, steel blade, 3 Jar	5 Nos.
30.	One way switch	6A, 240V	15 Nos.

3. Module Name: Electrical drawings and circuit diagrams**.**

Outcome: Connect various electrical appliances as per connection diagram.

Theory Content:

3.1 Single line diagram, power line diagram for installation of electrical wiring of building.
3.2. Connection diagram of a Ceiling fan/ Pedestal fan with regulator and switch.
3.3. Connection diagram of Fluorescent lamp with ballast and starter.
3.4. Connection diagram of Geyser with its accessories.
3.5. Connection diagram of Water pump motor with starter.
3.6. Connection diagram of Inverter and its internal circuit diagram.
3.7. Connection diagram of Stabilizer and its internal circuit diagram.

Practical Content: (Write a report on each practical)

1. Draw Single line diagram, power line diagram (commencing from energy meter) of electrical wiring of building.
2. Connect a Fluorescent lamp with ballast (electromagnetic and electronic) and test it with power.
3. Connect a Geyser with its accessories and test it with power.
4. Connect a single phase Water pump motor with starter and test it with power.
5. Connect a 3-phase Water pump motor with starter and test it with power.
6. Connect an Inverter with its accessories and test it with power.
7. Connect a Stabilizer with its accessories and test it with power.
8. Connect a Ceiling fan/ Pedestal fan with regulator and switch and test it with power.

Tools & Equipment needed: (For 30 Trainee)

Sl. No.	Item Description	Specification	Qty / Number
1.	Contactor	3-phase, 440volt,16amp, 2NO+ 2NC auxiliary contacts	15 Nos.
2.	Thermal overload relay	3-phase, 0-15 A, 440V	10 Nos.
3.	Timer relay	On delay type, 240V, 1NO+1NC	10 Nos.
4.	Timer relay	Off delay type, 240V, 1NO+1NC	10 Nos.
5.	Push button switch	10A, 240V	15 Nos.
6.	M.C.B.	4 pole, 16 A, 440V	10 Nos.
7.	3-phase squirrel cage induction motor	3-phase 400 volt, 50 Hz, 2 HP, 1440 rpm	4 Nos.
8.	Single phase induction motor	1 HP, 230 volt, 50 Hz, capacitor run	4 Nos.
9.	D.O.L starter	3-phase, 400 V, 50 Hz, 5HP	4 Nos.

10.	Automatic Star-Delta starter	3-phase, 400 V, 50 Hz, 7.5HP	4 Nos.
11.	Manual Star-Delta starter	3-phase, 400 V, 50 Hz, 7.5HP	4 Nos.
12.	Ceiling fan	900mm, 60W, 240V, 400rpm	5 Nos.
13.	Pedestal fan	400mm, 70W, 240V, 1350 rpm	5 Nos.
14.	Fluorescent lamp set with electronic ballast	36W, 240V	5 Nos.
15.	Fluorescent lamp set with electromagnetic ballast	36W, 240V	5 Nos.
16.	Electric iron	500W, 240V	5 Nos.
17.	Geyser	6 ltr, 240V	5 Nos.
18.	Water pump motor (single phase)	1HP, 240V, 50Hz	5 Nos.
19.	Water pump motor (3-phase)	1HP, 415V, 50Hz, 1440 rpm squirrel cage induction motor	5 Nos.
20.	Inverter	600VA, output 230V, 50Hz, battery - 12V, 130Ah, tubular type, 3hr backup time	5 Nos.
21.	Stabilizer	1000VA, 130 – 290V, 50Hz, Auto/Manual selectable, efficiency better than 96%, continuous duty	5 Nos.
22.	Mixer grinder	500W, 18000 rpm, steel blade, 3 Jar	5 Nos.

4. Module Name: Maintenance of wiring and household electrical appliance.

Outcome: Troubleshoot faults in domestic wiring and household electrical appliances

Theory Content:

4.1 Fault finding, repair, replacement and maintenance of equipments:

i) Ceiling fan/ pedestal fan: Connection diagram, regulator (electrical &electronics), maintenance of fan (overhauling), repair of some common problems like low speed, fan not starting, fan rotating in reverse direction, noisy operation, low voltage, faulty capacitor, faulty motor, faulty winding, faulty bearing.

ii) Room heater: Repairing of room heater for some common problems, replacement of coil, insulators, thermostat, low voltage.

iii) Electric iron: Repairing of electric iron, replacement of faulty coil, thermostat, checking of connecting cable.

iv) Water pump motor: Repairing of some common fault, motor not starting, tripping of motor, starter problem, checking of different parts of faulty starter, checking of supply voltage, checking of connecting cable, checking of motor winding, checking of capacitor for single phase motor.

v) Mixer grinder: Repairing of some common fault, motor not running, checking of selector switch, motor, reason of overheating, overloading.

vi) Geyser: Repairing of some common fault, checking of selector switch, thermostat, heating element, faulty PCB, temperature display, hardness of water.

vii) Florescent light fittings: Repairing of some common fault, checking of ballast, starter, connecting cable, end connector, defective lamp, loose contact, low supply voltage, wrong circuit connection.

viii) Inverter: Repairing of some common fault, faulty battery, loose battery connection, tripping due to

overload, reduced battery backup time.

ix) Stabilizer: Repairing of some common fault, checking of relay, tripping circuit, voltmeter, voltage level, circuit connection, servo motor, buck-boost transformer, auto transformer, control circuitry, motor driver.

x) Wiring of lighting and power circuit: Repairing of some common fault, faulty wiring accessories, replacement of accessories, neutral failure, earthing failure, discontinuity of cable, frequently blown fuses or tripped breakers, sparking due to loose connection, single phasing for 3-phase connection.

Practical Content: (Write a report on each practical)

1. Study of different faults in household wiring. Fuse blown, MCB trip or short circuit, overheated switch, socket and wires loose contact and overload. Polarity of all switches for connected in phase conductors. Checking of equal distribution of load on 3-phase wiring in large residential and commercial units. Checking of cable route, proper selection of conductors, wires and connectors and connection of single pole devices.
2. Testing of fluorescent lamp, electromagnetic and electronic ballast, starter and the corresponding circuit.
3. Testing of different parts of D.O.L starter (Push button switch, contactor, thermal overload).
4. Testing of different parts of automatic Star-Delta starter (Push button switch, contactor, thermal overload, timer relay).
5. Testing of different parts of an inverter and the corresponding circuit.
6. Testing of different parts of a voltage stabilizer and the corresponding circuit.
7. Testing of different parts of ceiling fan/ pedestal fan with their accessories and the corresponding circuit.
8. Testing of different parts of a geyser and the corresponding circuit.
9. Testing of different parts of water pump motor and the corresponding circuit.
10. Testing of different parts of a ceiling fan/ pedestal fan.

Tools & Equipment needed: (For 30 Trainee)

Sl. No.	Item Description	Specification	Qty / Number
1.	Contactor	3-phase, 440volt,16amp, 2NO+ 2NC auxiliary contacts	15 Nos.
2.	Thermal overload relay	3-phase, 0-15 A, 440V	10 Nos.
3.	Timer relay	On delay type, 240V, 1NO+1NC	10 Nos.
4.	Timer relay	Off delay type, 240V, 1NO+1NC	10 Nos.
5.	Push button switch	10A, 240V	15 Nos.
6.	M.C.B.	4 pole, 16 A, 440V	10 Nos.
7.	3-phase squirrel cage induction motor	3-phase 400 volt, 50 Hz, 2 HP, 1440 rpm	4 Nos.
8.	Single phase induction motor	1 HP, 230 volt, 50 Hz, capacitor run	4 Nos.
9.	D.O.L starter	3-phase, 400 V, 50 Hz, 5HP	4 Nos.
10.	Automatic Star-Delta starter	3-phase, 400 V, 50 Hz, 7.5HP	4 Nos.

11.	Manual Star-Delta starter	3-phase, 400 V, 50 Hz, 7.5HP	4 Nos.
12.	Ceiling fan	900mm, 60W, 240V, 400rpm	5 Nos.
13.	Pedestal fan	400mm, 70W, 240V, 1350 rpm	5 Nos.
14.	Fluorescent lamp set with electronic ballast	36W, 240V	5 Nos.
15.	Fluorescent lamp set with electromagnetic ballast	36W, 240V	5 Nos.
16.	Electric iron	500W, 240V	5 Nos.
17.	Geyser	6 ltr, 240V	5 Nos.
18.	Water pump motor (single phase)	1HP, 240V, 50Hz	5 Nos.
19.	Water pump motor (3-phase)	1HP, 415V, 50Hz, 1440 rpm squirrel cage induction motor	5 Nos.
20.	Inverter	600VA, output 230V, 50Hz, battery - 12V, 130Ah, tubular type, 3hr backup time	5 Nos.
21.	Stabilizer	1000VA, 130 – 290V, 50Hz, Auto/Manual selectable, efficiency better than 96%, continuous duty	5 Nos.
22.	Mixer grinder	500W, 18000 rpm, steel blade, 3 Jar	5 Nos.

5. Module Name: Health and safety

Outcome: Apply working safety practices

Theory Content:

5.1 Electrical Safety: Dos & don'ts for electrical work.
5.2 Causes of electrical accidents.
5.3 Health and safety procedures.
5.4 Procedure for rescuing the person who has received an electric shock, methods of providing artificial respiration.
5.5 Maintaining safety procedures for electrical fire, Types of fire extinguishers to be used for electrical fire.
5.6 Rescue from any emergency situation, First aid procedures.
5.7 Electrical safety rules (I.E. rules) for domestic appliances.
5.8 Safety guidelines for domestic wiring.

Practical Content: (Write a report on each practical)

1. Necessity and use of Personal protective Equipment (PPE).
2. Use of fire extinguisher.
3. Make a list for nomenclature of different Safety Symbol.
4. Use of Safety instrument and clothing.
5. Make a list for the items required in First Aid Box.
6. Make a list for implementation of Electrical safety rules (I.E. rules) for assembling and installation.

Tools & Equipment needed: (For 30 Trainee)

1. Personal protective Equipment (PPE) – 5 Sets
2. Fire extinguisher – 5 Nos.
3. First Aid Box – 5 Sets
4. Safety clothing – 5 Sets

6. Module Name: OJT

Outcome: Work in real job situation with special emphasis on basic safety and hazards in this domain

Practical Content:

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for **60 Hours.**)

7. Module Name: Employability Skills **(60 Hrs)**

Key Learning Outcomes

Introduction to Employability Skills Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

Constitutional values - Citizenship Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

Basic English Skills Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone

9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

Career Development & Goal Setting Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

Communication Skills Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

Diversity & Inclusion Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

Financial and Legal Literacy Duration:5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

Essential Digital Skills Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

Entrepreneurship Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

Customer Service Duration: 5 Hours

30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1.	Measure various electrical system parameters using necessary tools and equipment	**After completion of this module students will be able to:** 1.1 Identify different tools required for electrical wiring maintenance and fittings. 1.2 Identify different testing instruments required for repair and maintenance of domestic wiring. 1.3 Use different tools required for electrical equipment maintenance and fittings. 1.4 Use different testing instruments required for repair and maintenance of equipments.
2.	Demonstrate electrical domestic wiring and various components of electrical appliances.	**After completion of this module students will be able to:** 2.1 Identify and use of electrical wiring with all accessories. 2.2 Define different earthing systems. 2.3 Explain different components of electrical equipments with their functions as described in 2.3 of module-2
3.	Connect various electrical appliances as per connection diagram	**After completion of this module students will be able to:** 3.1 Interpret and draw single line diagram, power line diagram for installation of domestic wiring. 3.2 Define different symbols used to draw the single line diagram, power line diagram and components. 3.3 Interpret circuit diagrams of the electrical equipment as described in 3.2 – 3.7 of module-3 3.4 Connect electrical equipment as described in 3.2 – 3.7 of module-3
4.	Troubleshoot faults in domestic wiring and household electrical appliances	**After completion of this module students will be able to:** 4.1 Perform the procedures of fault finding, repair, replacement and maintenance of domestic wiring.

Module No.	Outcome	Assessment Criteria
		4.2 Perform the procedures of fault finding, repair, replacement and maintenance of electrical equipments such as ceiling fans, pedestal fan, fluorescent light fittings, electric iron, geyser, room heater, water pump motor, mixer grinder, inverter and stabilizer.
5.	Apply working safety practices	**After completion of this module students will be able to:** 5.1 Explain electrical safety rules (I.E. rules) for industry. 5.2 Maintain safety procedures for electrical fire. 5.3 Use fire extinguisher for electrical fire. 5.4 Use of Personal protective Equipment (PPE). 5.5 Use Safety instrument and clothing.
6.	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for 60 Hours.)
7.	Employability Skill	As per guided curriculum

Tools & Equipments: (For 30 Trainees)

Sl. No.	Item Description	Specification	Qty / Number
1.	Rule wooden	4 fold 60 mm	5 Nos.
2.	Screw driver	100 mm	5 Nos.
3.	Screw driver	150 mm	5 Nos.
4.	Heavy duty screw driver	200 mm	5 Nos.
5.	Electrician screw driver	250 mm thin stem insulated handle	5 Nos.
6.	Electrician connector, screw driver	100 mm insulated handle thin stem	5 Nos.
7.	Neon Tester	Standard	5 Nos.

Sl. No.	Item Description	Specification	Qty / Number
8.	Plier insulated	150 mm	5 Nos.
9.	Plier side cutting	150 mm	5 Nos.
10.	Knife double bladed Electrician	Standard	5 Nos.
11.	Hammer, cross peen	115 grams with handle	5 Nos.
12.	Hammer ball peen	0.75 kg. With handle	5 Nos.
13.	Pincer	150 mm	5 Nos.
14.	Firmer chisel wood	12 mm	5 Nos.
15.	Saw tenon	250 mm	5 Nos.
16.	Steel rule	300 mm	5 Nos.
17.	C. Clamp	200 mm, 150 mm and 100 mm.	5 Nos.
18.	Spanner	150 mm adjustable 15 degree	5 Nos.
19.	Blow lamp	0.5 litre	5 Nos.
20.	Chisel	25 mm & 6 mm	5 Nos.
21.	Electric drill machine portable	6 mm capacity	5 Nos.
22.	Allen key	Standard	5 Nos.
23.	Oil can	0.12 litre	5 Nos.
24.	Grease gun	Standard	5 Nos.
25.	Outside micrometer	0 to 25 mm	5 Nos.
26.	Motorised bench grinder	Grinder motor: 0.55 KW , 0.75 HP, 3 Phase , 2800 RPM	5 Nos.
27.	Pulley puller	3 jaw	5 Nos.
28.	Bearing puller	as per SKF bearing no.	5 Nos.
29.	Crimping tool	Standard	5 Nos.
30.	Scissors blade	150 mm	5 Nos.
31.	Wire stripper	20 cm	5 Nos.
32.	Hacksaw frame	200 mm adjustable	5 Nos.
33.	Hacksaw frame	300 mm adjustable	5 Nos.
34.	Flat nose plier	100 mm	5 nos
35.	Tweezers	100 mm	5 nos.
36.	Spanner	D.E. metric standard set	5 Nos.
37.	Gauge, wire imperial	Standard	5 Nos.
38.	File flat	200 mm 2nd cut	6 nos.
39.	File half round	200 mm 2nd cut	5 nos.
40.	File round	200 mm 2nd cut	5 nos.
41.	File flat	150 rough	5 nos.
42.	File flat	250 mm smooth	5 nos.
43.	Soldering Iron	25 watt, 65 watt	5 nos. each
44.	Desoldering gun	Spring loaded vacuum style solder remover	5 nos.
45.	Growler	Input 230V AC, Armature dia 20-100mm	5 Nos.

Sl. No.	Item Description	Specification	Qty / Number
46.	Digital multimeter	3 ½ digits, LCD display, 0-1000 M Ohms, 750 volt AC, 1000V DC, 10A	5 Nos.
47.	A.C. Voltmeter	MI type, 0-500V	5 Nos.
48.	D.C. Voltmeter	MC type, 0-500V	5 Nos.
49.	A.C. Ammeter	MI type, 0-10A	5 Nos.
50.	D.C. Ammeter	MC type, 0-10A	5 Nos.
51.	Wattmeter	Dynamometer type, 150-300-600V, 5-10A	5 Nos.
52.	Megger	500 Volt	5 Nos.
53.	Digital 4-wire Earth resistance tester	Earth Resistance 0-2Ω, 0-20Ω, 0-200Ω, 0-2kΩ. Voltage 0-300 AC	5 Nos.
54.	D.C. power supply	Dual channel, 0-30V, 2A	5 Nos.
55.	Clamp meter	AC/DC current 0-400A, AC/DC voltage 0-600V, Frequency 5-500Hz	5 Nos.
56.	Fuse	Kit Kat type, 10A	10 Nos.
57.	Fuse	Cartridge type, 10A	10 Nos.
58.	Conduit	PVC, 25 mm diameter, 2mm thick, for 1.5 mm^2 Al wire	20 Nos.
59.	Conduit bend	20 mm	20 Nos.
60.	Saddle	20 mm, metallic	50 Nos.
61.	Junction box	25 mm, two way	10 Nos.
62.	Socket	5 Pin, 240V, 16A	10 Nos.
63.	Contactor	3-phase, 440volt,16amp, 2NO+ 2NC auxiliary contacts	10 Nos.
64.	Thermal overload relay	3-phase, 0-15 A, 440V	10 Nos.
65.	Timer relay	On delay type, 240V, 1NO+1NC	10 Nos.
66.	Timer relay	Off delay type, 240V, 1NO+1NC	10 Nos.
67.	Push button switch	10A, 240V	10 Nos.
68.	M.C.B.	4 pole, 16 A, 440V	10 Nos.
69.	3-phase squirrel cage induction motor	3-phase 400 volt, 50 Hz, 2 HP, 1440 rpm	5 Nos.
70.	Single phase induction motor	1 HP, 230 volt, 50 Hz, capacitor run	5 Nos.
71.	Single phase induction motor	1 HP, 230 volt, 50 Hz, capacitor run	4 Nos.
72.	D.O.L starter	3-phase, 400 V, 50 Hz, 5HP	5 Nos.
73.	Automatic Star-Delta starter	3-phase, 400 V, 50 Hz, 7.5HP	5 Nos.
74.	Manual Star-Delta starter	3-phase, 400 V, 50 Hz, 7.5HP	5 Nos.
75.	Ceiling fan	900mm, 60W, 240V, 400rpm	5 Nos.
76.	Pedestal fan	400mm, 70W, 240V, 1350 rpm	5 Nos.
77.	Fluorescent lamp set with electronic ballast	36W, 240V	5 Nos.
78.	Fluorescent lamp set with	36W, 240V	5 Nos.

Sl. No.	Item Description	Specification	Qty / Number
	electromagnetic ballast		
79.	Electric iron	500W, 240V	5 Nos.
80.	Geyser	6 ltr, 240V	5 Nos.
81.	Water pump motor (single phase)	1HP, 240V, 50Hz	5 Nos.
82.	Water pump motor (3-phase)	1HP, 415V, 50Hz, 1440 rpm squirrel cage induction motor	5 Nos.
83.	Inverter	600VA, output 230V, 50Hz, battery - 12V, 130Ah, tubular type, 3hr backup time	5 Nos.
84.	Stabilizer	1000VA, 130 – 290V, 50Hz, Auto/Manual selectable, efficiency better than 96%, continuous duty	5 Nos.
85.	Mixer grinder	500W, 18000 rpm, steel blade, 3 Jar	5 Nos.

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks	Total OJT marks
Measure various electrical system parameters using necessary tools and equipment	PWR/3110/OC1	20	110	0
Demonstrate electrical domestic wiring and various components of electrical appliances.	PWR/3110/OC2	40	140	0
Connect various electrical appliances as per connection diagram	PWR/3110/OC3	20	110	0
Troubleshoot faults in domestic wiring and household electrical appliances	PWR/3110/OC4	50	200	0
Apply working safety practices	PWR/3110/OC5	20	90	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	PWR/3110/OC6	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0