



Qualification Pack

Technician - Room Air Conditioner & Home Appliances

QP Code: MSME/ELE/Q2401

Version: 1.0

NSQF Level: 4

MSME TECHNOLOGY CENTRE ||
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Qualification Pack

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Qualification Pack

MSME/ELE/Q2401: Technician - Room Air Conditioner & Home Appliances

Brief Job Description

Installation, repairing & servicing of AC/Refrigerator/Washing Machine & Microwave Oven

Personal Attributes

Installation, repairing & servicing of AC/Refrigerator/Washing Machine & Microwave Oven

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [MSME/ELE/N2403: ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA](#)
2. [MSME/ELE/N2402: ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA](#)
3. [MSME/ELE/N2401: STUDY ON BASIC ELECTRICAL/ELECTRONICS, SAFETY & HAND TOOLS -RACHA](#)
4. [MSME/ELE/N2404: Employability skills 09](#)
5. [MSME/ELE/N2405: OJT 03](#)

Qualification Pack (QP) Parameters

Sector	Electronics
Sub-Sector	Strategic Electronics
Occupation	Electronics Servicing
Country	India
NSQF Level	4
Credits	20
Aligned to NCO/ISCO/ISIC Code	(Field Technician: Air-Conditioner)



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Minimum Educational Qualification & Experience	12th grade Pass with NA of experience OR Completed 2nd year of 3-year diploma (after 10th) and pursuing regular diploma with NA of experience OR 10th grade pass (10th grade pass with two years of any combination of NTC/NAC/CITS or equivalent) with NA of experience OR Previous relevant Qualification of NSQF Level (NSQF Level 3.5) with 1.5 years of experience
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	17 Years
Last Reviewed On	NA
Next Review Date	30/04/2027
NSQC Approval Date	30/04/2024
Version	1.0
Reference code on NQR	NCVET- QG-04-EH-02387-2024-V1-MSME
NQR Version	1.0



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MSME/ELE/N2403: ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA

Description

Understand mechanism of AC, REFRIGERATOR, WASHING MACHINE, OVEN

Scope

The scope covers the following :

- Understand mechanism of AC, REFRIGERATOR, WASHING MACHINE, OVEN

Elements and Performance Criteria

MSME/RACH A/02 ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA

To be competent, the user/individual on the job must be able to:

- PC1.**
 - Introduction- Company overview, Philosophy & Product portfolio.
 - Reporting Structure & Individual's role
- PC2.**
 - Basic Terminology- Electrical and Electronics: Introduction to electricity,
 - Electric current, emf, resistance; Power; Ohms law. Types of circuits- series,
 - parallel, open & closed. Basic Components. Heat: What is heat; Heat
 - transfer-conduction, convection, radiation; Forms of heat; Heat load.
- PC3.**
 - AC - Basics- Types of compressor and their operating principles -
 - Reciprocating, Rotary, Scroll, Screw. Types of heat exchangers and their
 - functioning, Fin and tube, PFC, shell and tube, plate type; Problems in heat
 - exchanger. Types of fan and blowers - propeller, centrifugal, cross flow.
 - Expansion Devices - Capillary, TEV, EEV Accessories- Accumulator, Oil
 - separator, Receiver, Mufflers, Thermostat, 4-Way reversing valve, Heat
 - Pump Cycle Types and functioning of motors - AC / DC motors Overview
- PC4.**
 - AC - Tools & Safety- Basic tools identification - Tube cutter, Drilling
 - machine, Flaring tool, Tube benders etc. General safety guidelines, Product
 - Prevention - Introduction, PL case by wrong installation
- PC5.**
 - AC - Installation- Installation instruction, Correct Installation method,
 - Place Selection (Indoor & Outdoor) Pre Installation Requisites & Post
 - Installation checkpoints Pipe cutting, Flaring, Bending, Swaging, Tube brazing
 - practice Core Drilling exercise, Tube insulation, wiring and piping
 - layout, Vacuuming, Gas Charging Method, Complete Installation. Remote
 - control features and demo with Role Play Cassette Unit Installation,
 - Installation - Do's & Don'ts



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- PC6.**
- AC - Trouble Shooting- Compressor trouble shooting, Symptoms of failure, How to check failed Compressor, Steps to replace compressor
 - Electrical trouble shooting, How to diagnose electrical parts failure,
 - Checking of PCB. Symptom based troubleshooting : No Cooling Repair, No Power Repair, Noise Repair, Water leakage Repair Overview of Star labeling (BEE) & E-Waste Concept Safety Precautions, Preventive Maintenance & Cleaning of AC, Important Tips, Checkpoints, Optional Skills
- PC7.**
- Refrigerator Basics- Home Appliances Product Range, Repair and Installation Tools Kit & Safety Precautions What are Refrigerator?
 - Advantages of Refrigerator; Types of Refrigerators, Difference between Direct Cool & Frost Free Refrigerator, What is Refrigeration? Steps of Refrigeration Cycle, Sealed System parts working process, what is refrigerant & types of refrigerants. Key Features, Correct Installation Place, Installation Process, How to use?, No Defect Found Solutions, Do's and Don'ts / Saf
- PC8.**
- Direct Cool Refrigerator- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC9.**
- Mechanical Frost Free Refrigerator- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC10.**
- Semi Electronics Frost Free Refrigerator- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC11.**
- Electronics Frost Free Refrigerator- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC12.**
- Inverter Refrigerator- Demerits of Conventional Compressor Merits of Inverter Compressor Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault, Check Points
- PC13.**
- Refrigerator Sealed System- Mandatory Parts & Equipments, Symptoms, Refrigerant Discharge Process, Compressor disassembling, Nitrogen Flushing , Parts Assembling, Leakage Testing, Vacuuming, R600a Safe Gas Charging Process, Final Inspection
- PC14.**
- Washing Machine Basics- What is Washing Machine & its advantages. Types of Washing machine, Difference between Semi Automatic & Fully Automatic Washing Machine, Washing Principle Key Features, Correct Installation Place, Installation Process, How to use, No Defect Found Solutions, Do's and Don'ts / Safety Precautions , Check points
- PC15.**
- Semi Automatic Washing Machine- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC16.**
- Fully Automatic Washing Machine- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC17.**
- Microwave Oven Basics- What is Microwave Oven, Advantages, Types of Microwave Oven, Difference between Solo, Grill and Convection Oven Working Principle Key Features, Correct Installation Place, Installation Precautions, How to use, No Defect Found Solutions , Do's and Don'ts / Safety Precautions
- PC18.**
- Convection Microwave Oven- Parts Working and Checking process Assembly & Disassembly, Wiring Diagram, Technical Fault



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/RACH A/02 ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA</i>	-	100	-	-
PC1. • Introduction- Company overview, Philosophy & Product portfolio. • Reporting Structure & Individual's role	-	-	-	-
PC2. • Basic Terminology- Electrical and Electronics: Introduction to electricity, • Electric current, emf, resistance; Power; Ohms law. Types of circuits- series, • parallel, open & closed. Basic Components. Heat: What is heat; Heat • transfer-conduction, convection, radiation; Forms of heat; Heat load.	-	-	-	-
PC3. • AC – Basics- Types of compressor and their operating principles - • Reciprocating, Rotary, Scroll, Screw. Types of heat exchangers and their • functioning, Fin and tube, PFC, shell and tube, plate type; Problems in heat • exchanger. Types of fan and blowers - propeller, centrifugal, cross flow. • Expansion Devices - Capillary, TEV, EEV - Accessories- Accumulator, Oil • separator, Receiver, Mufflers, Thermostat, 4-Way reversing valve, Heat • Pump Cycle Types and functioning of motors - AC / DC motors Overview	-	-	-	-
PC4. • AC – Tools & Safety- Basic tools identification - Tube cutter, Drilling • machine, Flaring tool, Tube benders etc. General safety guidelines, Product • Prevention - Introduction, PL case by wrong installation	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC5. • AC – Installation- Installation instruction, Correct Installation method, • Place Selection (Indoor & Outdoor)Pre Installation Requisites & Post • Installation checkpoints Pipe cutting, Flaring, Bending, Swaging, Tube brazing practice Core Drilling exercise, Tube insulation, wiring and piping • layout, Vacuuming, Gas Charging Method, Complete Installation. Remote • control features and demo with Role Play Cassette Unit Installation, • Installation – Do's & Don'ts	-	-	-	-
PC6. • AC - Trouble Shooting- Compressor trouble shooting, Symptoms of • failure, How to check failed Compressor, Steps to replace compressor • Electrical trouble shooting, How to diagnose electrical parts failure, • Checking of PCB. Symptom based troubleshooting : No Cooling Repair, No • Power Repair, Noise Repair, Water leakage Repair Overview of Star labeling • (BEE) & E-Waste Concept Safety Precautions, Preventive Maintenance & • Cleaning of AC, Important Tips, Checkpoints, Optional Skills	-	-	-	-
PC7. • Refrigerator Basics- Home Appliances Product Range, Repair and • Installation Tools Kit & Safety Precautions What are Refrigerator? • Advantages of Refrigerator; Types of Refrigerators, Difference between • Direct Cool & Frost Free Refrigerator, What is Refrigeration? Steps of • Refrigeration Cycle, Sealed System parts working process, what is • refrigerant & types of refrigerants. Key Features, Correct Installation Place, • Installation Process, How to use?, No Defect Found Solutions, Do's and • Don'ts / Saf	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC8. • Direct Cool Refrigerator- Parts Working and Checking process Parts • Assembly & Disassembly Process Wiring Diagram, Technical Fault	-	-	-	-
PC9. • Mechanical Frost Free Refrigerator- Parts Working and Checking • process Parts Assembly & Disassembly Process Wiring Diagram, Technical • Fault	-	-	-	-
PC10. • Semi Electronics Frost Free Refrigerator- Parts Working and Checking • process Parts Assembly & Disassembly Process Wiring Diagram, Technical • Fault	-	-	-	-
PC11. • Electronics Frost Free Refrigerator- Parts Working and Checking process • Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault	-	-	-	-
PC12. • Inverter Refrigerator- Demerits of Conventional Compressor Merits of • Inverter Compressor Parts Working and Checking process Parts Assembly & • Disassembly Process Wiring Diagram, Technical Fault, Check Points	-	-	-	-
PC13. • Refrigerator Sealed System- Mandatory Parts & Equipments, Symptoms, • Refrigerant Discharge Process, Compressor disassembling, Nitrogen • Flushing , Parts Assembling, Leakage Testing, Vacuuming, R600a Safe Gas • Charging Process, Final Inspection	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. - Washing Machine Basics- What is Washing Machine & its advantages. - Types of Washing machine, Difference between Semi Automatic & Fully - Automatic Washing Machine, Washing Principle Key Features, Correct - Installation Place, Installation Process, How to use, No Defect Found - Solutions, Do's and Don'ts / Safety Precautions , Check points	-	-	-	-
PC15. - Semi Automatic Washing Machine- Parts Working and Checking process - Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault	-	-	-	-
PC16. - Fully Automatic Washing Machine- Parts Working and Checking process - Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault	-	-	-	-
PC17. - Microwave Oven Basics- What is Microwave Oven, Advantages, Types - of Microwave Oven, Difference between Solo, Grill and Convection Oven - Working Principle Key Features, Correct Installation Place, Installation - Precautions, How to use, No Defect Found Solutions , Do's and Don'ts / - Safety Precautions	-	-	-	-
PC18. - Convection Microwave Oven- Parts Working and Checking process - Assembly & Disassembly, Wiring Diagram, Technical Fault	-	-	-	-
NOS Total	-	100	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N2403
NOS Name	ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA
Sector	Electronics
Sub-Sector	
Occupation	Electronics Servicing
NSQF Level	4
Credits	7
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQF Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N2402: ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA

Description

Understand mechanism of AC, REFRIGERATOR, WASHING MACHINE, OVEN

Scope

The scope covers the following :

- Understand mechanism of AC, REFRIGERATOR, WASHING MACHINE, OVEN

Elements and Performance Criteria

MSME/RACH A/02 ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA

To be competent, the user/individual on the job must be able to:

- PC1.**
 - Introduction- Company overview, Philosophy & Product portfolio.
 - Reporting Structure & Individual's role
- PC2.**
 - Basic Terminology- Electrical and Electronics: Introduction to electricity,
 - Electric current, emf, resistance; Power; Ohms law. Types of circuits- series,
 - parallel, open & closed. Basic Components. Heat: What is heat; Heat
 - transfer-conduction, convection, radiation; Forms of heat; Heat load.
- PC3.**
 - AC - Basics- Types of compressor and their operating principles -
 - Reciprocating, Rotary, Scroll, Screw. Types of heat exchangers and their
 - functioning, Fin and tube, PFC, shell and tube, plate type; Problems in heat
 - exchanger. Types of fan and blowers - propeller, centrifugal, cross flow.
 - Expansion Devices - Capillary, TEV, EEV Accessories- Accumulator, Oil
 - separator, Receiver, Mufflers, Thermostat, 4-Way reversing valve, Heat
 - Pump Cycle Types and functioning of motors - AC / DC motors Overview
- PC4.**
 - AC - Tools & Safety- Basic tools identification - Tube cutter, Drilling
 - machine, Flaring tool, Tube benders etc. General safety guidelines, Product
 - Prevention - Introduction, PL case by wrong installation
- PC5.**
 - AC - Installation- Installation instruction, Correct Installation method,
 - Place Selection (Indoor & Outdoor)Pre Installation Requisites & Post
 - Installation checkpoints Pipe cutting, Flaring, Bending, Swaging, Tube brazing
 - practice Core Drilling exercise, Tube insulation, wiring and piping
 - layout, Vacuuming, Gas Charging Method, Complete Installation. Remote
 - control features and demo with Role Play Cassette Unit Installation,
 - Installation - Do's & Don'ts



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- PC6.**
- AC - Trouble Shooting- Compressor trouble shooting, Symptoms of failure, How to check failed Compressor, Steps to replace compressor
 - Electrical trouble shooting, How to diagnose electrical parts failure,
 - Checking of PCB. Symptom based troubleshooting : No Cooling Repair, No Power Repair, Noise Repair, Water leakage Repair Overview of Star labeling (BEE) & E-Waste Concept Safety Precautions, Preventive Maintenance & Cleaning of AC, Important Tips, Checkpoints, Optional Skills
- PC7.**
- Refrigerator Basics- Home Appliances Product Range, Repair and Installation Tools Kit & Safety Precautions What are Refrigerator?
 - Advantages of Refrigerator; Types of Refrigerators, Difference between Direct Cool & Frost Free Refrigerator, What is Refrigeration? Steps of Refrigeration Cycle, Sealed System parts working process, what is refrigerant & types of refrigerants. Key Features, Correct Installation Place, Installation Process, How to use?, No Defect Found Solutions, Do's and Don'ts / Saf
- PC8.**
- Direct Cool Refrigerator- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC9.**
- Mechanical Frost Free Refrigerator- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC10.**
- Semi Electronics Frost Free Refrigerator- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC11.**
- Electronics Frost Free Refrigerator- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC12.**
- Inverter Refrigerator- Demerits of Conventional Compressor Merits of Inverter Compressor Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault, Check Points
- PC13.**
- Refrigerator Sealed System- Mandatory Parts & Equipments, Symptoms, Refrigerant Discharge Process, Compressor disassembling, Nitrogen Flushing , Parts Assembling, Leakage Testing, Vacuuming, R600a Safe Gas Charging Process, Final Inspection
- PC14.**
- Washing Machine Basics- What is Washing Machine & its advantages. Types of Washing machine, Difference between Semi Automatic & Fully Automatic Washing Machine, Washing Principle Key Features, Correct Installation Place, Installation Process, How to use, No Defect Found Solutions, Do's and Don'ts / Safety Precautions , Check points
- PC15.**
- Semi Automatic Washing Machine- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC16.**
- Fully Automatic Washing Machine- Parts Working and Checking process Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault
- PC17.**
- Microwave Oven Basics- What is Microwave Oven, Advantages, Types of Microwave Oven, Difference between Solo, Grill and Convection Oven Working Principle Key Features, Correct Installation Place, Installation Precautions, How to use, No Defect Found Solutions , Do's and Don'ts / Safety Precautions
- PC18.**
- Convection Microwave Oven- Parts Working and Checking process Assembly & Disassembly, Wiring Diagram, Technical Fault



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/RACH A/02 ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA</i>	100	-	-	-
PC1. • Introduction- Company overview, Philosophy & Product portfolio. • Reporting Structure & Individual's role	-	-	-	-
PC2. • Basic Terminology- Electrical and Electronics: Introduction to electricity, • Electric current, emf, resistance; Power; Ohms law. Types of circuits- series, • parallel, open & closed. Basic Components. Heat: What is heat; Heat • transfer-conduction, convection, radiation; Forms of heat; Heat load.	-	-	-	-
PC3. • AC – Basics- Types of compressor and their operating principles - • Reciprocating, Rotary, Scroll, Screw. Types of heat exchangers and their • functioning, Fin and tube, PFC, shell and tube, plate type; Problems in heat • exchanger. Types of fan and blowers - propeller, centrifugal, cross flow. • Expansion Devices - Capillary, TEV, EEV - Accessories- Accumulator, Oil • separator, Receiver, Mufflers, Thermostat, 4-Way reversing valve, Heat • Pump Cycle Types and functioning of motors - AC / DC motors Overview	-	-	-	-
PC4. • AC – Tools & Safety- Basic tools identification - Tube cutter, Drilling • machine, Flaring tool, Tube benders etc. General safety guidelines, Product • Prevention - Introduction, PL case by wrong installation	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC5. - AC – Installation- Installation instruction, Correct Installation method, - Place Selection (Indoor & Outdoor)Pre Installation Requisites & Post - Installation checkpoints Pipe cutting, Flaring, Bending, Swaging, Tube brazing practice Core Drilling exercise, Tube insulation, wiring and piping - layout, Vacuuming, Gas Charging Method, Complete Installation. Remote - control features and demo with Role Play Cassette Unit Installation, - Installation – Do's & Don'ts	-	-	-	-
PC6. - AC - Trouble Shooting- Compressor trouble shooting, Symptoms of - failure, How to check failed Compressor, Steps to replace compressor - Electrical trouble shooting, How to diagnose electrical parts failure, - Checking of PCB. Symptom based troubleshooting : No Cooling Repair, No - Power Repair, Noise Repair, Water leakage Repair Overview of Star labeling (BEE) & E-Waste Concept Safety Precautions, Preventive Maintenance & - Cleaning of AC, Important Tips, Checkpoints, Optional Skills	-	-	-	-
PC7. - Refrigerator Basics- Home Appliances Product Range, Repair and - Installation Tools Kit & Safety Precautions What are Refrigerator? - Advantages of Refrigerator; Types of Refrigerators, Difference between - Direct Cool & Frost Free Refrigerator, What is Refrigeration? Steps of - Refrigeration Cycle, Sealed System parts working process, what is - refrigerant & types of refrigerants. Key Features, Correct Installation Place, - Installation Process, How to use?, No Defect Found Solutions, Do's and - Don'ts / Saf	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC8. • Direct Cool Refrigerator- Parts Working and Checking process Parts • Assembly & Disassembly Process Wiring Diagram, Technical Fault	-	-	-	-
PC9. • Mechanical Frost Free Refrigerator- Parts Working and Checking • process Parts Assembly & Disassembly Process Wiring Diagram, Technical • Fault	-	-	-	-
PC10. • Semi Electronics Frost Free Refrigerator- Parts Working and Checking • process Parts Assembly & Disassembly Process Wiring Diagram, Technical • Fault	-	-	-	-
PC11. • Electronics Frost Free Refrigerator- Parts Working and Checking process • Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault	-	-	-	-
PC12. • Inverter Refrigerator- Demerits of Conventional Compressor Merits of • Inverter Compressor Parts Working and Checking process Parts Assembly & • Disassembly Process Wiring Diagram, Technical Fault, Check Points	-	-	-	-
PC13. • Refrigerator Sealed System- Mandatory Parts & Equipments, Symptoms, • Refrigerant Discharge Process, Compressor disassembling, Nitrogen • Flushing , Parts Assembling, Leakage Testing, Vacuuming, R600a Safe Gas • Charging Process, Final Inspection	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. - Washing Machine Basics- What is Washing Machine & its advantages. - Types of Washing machine, Difference between Semi Automatic & Fully - Automatic Washing Machine, Washing Principle Key Features, Correct - Installation Place, Installation Process, How to use, No Defect Found - Solutions, Do's and Don'ts / Safety Precautions , Check points	-	-	-	-
PC15. - Semi Automatic Washing Machine- Parts Working and Checking process - Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault	-	-	-	-
PC16. - Fully Automatic Washing Machine- Parts Working and Checking process - Parts Assembly & Disassembly Process Wiring Diagram, Technical Fault	-	-	-	-
PC17. - Microwave Oven Basics- What is Microwave Oven, Advantages, Types - of Microwave Oven, Difference between Solo, Grill and Convection Oven - Working Principle Key Features, Correct Installation Place, Installation - Precautions, How to use, No Defect Found Solutions , Do's and Don'ts / - Safety Precautions	-	-	-	-
PC18. - Convection Microwave Oven- Parts Working and Checking process - Assembly & Disassembly, Wiring Diagram, Technical Fault	-	-	-	-
NOS Total	100	-	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N2402
NOS Name	ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA
Sector	Electronics
Sub-Sector	
Occupation	Electronics Servicing
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQF Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N2401: STUDY ON BASIC ELECTRICAL/ELECTRONICS, SAFETY & HAND TOOLS -RACHA

Description

Get knowledge about Safety and Safety Precautions.

Scope

The scope covers the following :

- Get knowledge about Safety and Safety Precautions.

Elements and Performance Criteria

MSME/RACH A/01STUDY ON BASIC ELECTRICAL /ELECTRONICS, SAFETY & HAND TOOLS - RACHA

To be competent, the user/individual on the job must be able to:

- PC1.**
 - Safety- Basic knowledge about safety General safety precautions.
 - Accidents Fire and Fire Accidents First Aid. Personal Protective Equipment
 - (PPE) Selecting and using PPE. Maintenance of PPE. Monitor and review.
 - Types of PPE. Emergency equipment. Basic hand tools Types of
 - Screwdrivers Pliers, Tweezers, Steel Rule, and Scriber.
- PC2.**
 - Electronics Fundamentals- What is Matter, molecules, atom. Brief
 - knowledge about Voltage and current. Various types of Voltage and current
 - device. Checking Process of Resistor, capacitor Basic units Basic of
 - computer and its use.
- PC3.**
 - Basic electronics- Process of Inductors. Describe Conductor, insulator,
 - wire. Describe the types of Power supplies. 20 Process of Soldering,
 - disordering equipment's.
- PC4.**
 - Semiconductor- Semiconductor physics. Semiconductor diodes. Filters.
 - Special purpose diodes Power supply.
- PC5.**
 - Transistor and its application- Types of transistor. BJT. FET. Identify
 - transistor terminals. Applications of transistor.
- PC6.**
 - Basic technology- What is ohm's law, what is voltage, current,
 - resistance? Series circuit and parallel circuit. Resistor, Variable
 - Resistor(Rheostat), Trimmer Capacitor Polarized Capacitor, LED (Light
 - Emitting Diode), Photodiode, Transistor NPN, Transistor PNP.



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/RACH A/01STUDY ON BASIC ELECTRICAL /ELECTRONICS, SAFETY & HAND TOOLS - RACHA</i>	100	-	-	-
PC1. • Safety- Basic knowledge about safety General safety precautions. • Accidents Fire and Fire Accidents First Aid. Personal Protective Equipment • (PPE) Selecting and using PPE. Maintenance of PPE. Monitor and review. • Types of PPE. Emergency equipment. Basic hand tools Types of • Screwdrivers Pliers, Tweezers, Steel Rule, and Scriber.	-	-	-	-
PC2. • Electronics Fundamentals- What is Matter, molecules, atom. Brief • knowledge about Voltage and current. Various types of Voltage and current • device. Checking Process of Resistor, capacitor Basic units Basic of • computer and its use.	-	-	-	-
PC3. • Basic electronics- Process of Inductors. Describe Conductor, insulator, • wire. Describe the types of Power supplies. 20 Process of Soldering, • disordering equipment's.	-	-	-	-
PC4. • Semiconductor- Semiconductor physics. Semiconductor diodes. Filters. • Special purpose diodes Power supply.	-	-	-	-
PC5. • Transistor and its application- Types of transistor. BJT. FET. Identify • transistor terminals. Applications of transistor.	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC6. • Basic technology- What is ohm's law, what is voltage, current, resistance? Series circuit and parallel circuit. Resistor, Variable • Resistor(Rheostat), Trimmer Capacitor Polarized Capacitor, LED (Light Emitting Diode), Photodiode, Transistor NPN, Transistor PNP.	-	-	-	-
NOS Total	100	-	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N2401
NOS Name	STUDY ON BASIC ELECTRICAL/ELECTRONICS, SAFETY & HAND TOOLS - RACHA
Sector	Electronics
Sub-Sector	
Occupation	Electronics Servicing
NSQF Level	4
Credits	3
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQF Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N2404: Employability skills 09

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English a

Scope

The scope covers the following :

- This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century,
- digital, financial, and legal literacy, diversity and Inclusion, English a

Elements and Performance Criteria

MSME/ES/01 Employability skills

To be competent, the user/individual on the job must be able to:

- PC1.** Explain the major applications of MS Office
- PC2.** Explain the different types of e-commerce
- PC3.** List the benefits of e-commerce for retailers and customers
- PC4.** Discuss how the Digital India campaign will help boost e-commerce in India
- PC5.** Write applications pertaining to various matters.
- PC6.** Explain power of positive attitude and Importance of commitment
- PC7.** Explain motivation and the Ways to motivate oneself and Personal goal setting
- PC8.** Explain the Effective & Level of Communication
- PC9.** Explain communication and Significance of technical communication?
- PC10.** Explain the methods of listening Skills.
- PC11.** Explain the differences between bio-data, CV and Resume
- PC12.** Explain verbal and non-verbal Communication
- PC13.** Explain how to face an interview
- PC14.** Explain team work, group work, team formation process
- PC15.** How to Minimize the team conflicts
- PC16.** Explain Ethics & values
- PC17.** Explain the concept of entrepreneurship, and entrepreneurship v/s Management
- PC18.** Explain the process of project report preparation for setting up a new business
- PC19.**
 - Explain the role of various schemes and institute for self-employment i.e MSME, DIC, NSIC,
 - SIDBI etc
- PC20.** Role of financial institution to support startup
- PC21.** Discuss the importance of saving money
- PC22.** Discuss the main types of bank accounts
- PC23.** Differentiate between fixed and variable costs



Qualification Pack

PC24. Describe the different types of insurance products



Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/ES/01 Employability skills</i>	100	-	-	-
PC1. Explain the major applications of MS Office	-	-	-	-
PC2. Explain the different types of e-commerce	-	-	-	-
PC3. List the benefits of e-commerce for retailers and customers	-	-	-	-
PC4. Discuss how the Digital India campaign will help boost e-commerce in India	-	-	-	-
PC5. Write applications pertaining to various matters.	-	-	-	-
PC6. Explain power of positive attitude and Importance of commitment	-	-	-	-
PC7. Explain motivation and the Ways to motivate oneself and Personal goal setting	-	-	-	-
PC8. Explain the Effective & Level of Communication	-	-	-	-
PC9. Explain communication and Significance of technical communication?	-	-	-	-
PC10. Explain the methods of listening Skills.	-	-	-	-
PC11. Explain the differences between bio-data, CV and Resume	-	-	-	-
PC12. Explain verbal and non-verbal Communication	-	-	-	-
PC13. Explain how to face an interview	-	-	-	-
PC14. Explain team work, group work, team formation process	-	-	-	-
PC15. How to Minimize the team conflicts	-	-	-	-
PC16. Explain Ethics & values	-	-	-	-
PC17. Explain the concept of entrepreneurship, and entrepreneurship v/s Management	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC18. Explain the process of project report preparation for setting up a new business	-	-	-	-
PC19. • Explain the role of various schemes and institute for self-employment i.e MSME, DIC, NSIC, • SIDBI etc	-	-	-	-
PC20. Role of financial institution to support startup	-	-	-	-
PC21. Discuss the importance of saving money	-	-	-	-
PC22. Discuss the main types of bank accounts	-	-	-	-
PC23. Differentiate between fixed and variable costs	-	-	-	-
PC24. Describe the different types of insurance products	-	-	-	-
NOS Total	100	-	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N2404
NOS Name	Employability skills 09
Sector	Electronics
Sub-Sector	
Occupation	Electronics Servicing
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQC Clearance Date	30/04/2024



Qualification Pack

MSME/ELE/N2405: OJT 03

Description

Understand about how to work with Team

Scope

The scope covers the following :

- Understand about how to work with Team

Elements and Performance Criteria

MSME/RACH A/03 OJT

To be competent, the user/individual on the job must be able to:

- PC1.**
- Mentioning the process and procedure carried by the trainee
 - on daily basis for completing the assign task duly endorsed by
 - the authorized personnel and The report must contain:
 - Details of Department/ Organization
 - Installation Demonstration servicing Repairing Troubleshooting Gas
 - charging
 - ● Brief Job description
 - ● Daily work activity
 - ● Specific problem face if any with the solution.
 - ● Technical Books referred during the OJT
 - Conclusion
 - Installation Demonstration servicing Repairing Troubleshooting



Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>MSME/RACH A/03 OJT</i>	-	-	-	100
PC1. • Mentioning the process and procedure carried by the trainee • on daily basis for completing the assign task duly endorsed by • the authorized personnel and The report must contain: • Details of Department/ Organization • Installation Demonstration servicing - Repairing Troubleshooting Gas • charging • ● Brief Job description • ● Daily work activity • ● Specific problem face if any with the solution. • ● Technical Books referred during the OJT • Conclusion • Installation Demonstration servicing - Repairing Troubleshooting	-	-	-	-
NOS Total	-	-	-	100



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	MSME/ELE/N2405
NOS Name	OJT 03
Sector	Electronics
Sub-Sector	
Occupation	Electronics Servicing
NSQF Level	4
Credits	7
Version	1.0
Last Reviewed Date	30/04/2024
Next Review Date	30/04/2027
NSQC Clearance Date	30/04/2024

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

as per QP

Minimum Aggregate Passing % at QP Level : 40

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS



Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
MSME/ELE/N2403.ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA	0	100	0	0	100	20
MSME/ELE/N2402.ADVANCE SKILL ENHANCEMENT ON TROUBLESHOOTING, ASSEMBLY, DISASSEMBLY, INSTALLATION & DEMONSTRATION ON RESPECTIVE PRODUCTS -RACHA	100	0	0	0	100	20
MSME/ELE/N2401.STUDY ON BASIC ELECTRICAL/ELECTRONICS, SAFETY & HAND TOOLS - RACHA	100	0	0	0	100	20
MSME/ELE/N2404.Employability skills 09	100	0	0	0	100	10
MSME/ELE/N2405.OJT 03	0	0	0	100	100	30
Total	300	100	-	100	500	100



Qualification Pack

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training



Qualification Pack

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.



Qualification Pack

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.