Field Engineer RACW

QP Code: ELE/Q3105

Version: 2.0

NSQF Level: 5

Electronics Sector Skills Council of India || 155, 2nd Floor, ESC House Okhla Industrial Area-Phase 3
New Delhi- 110020 || email:ceo@essc-india.org
## Contents

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELE/Q3105</td>
<td>Field Engineer RACW</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Brief Job Description</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Applicable National Occupational Standards (NOS)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Compulsory NOS</strong></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Qualification Pack (QP) Parameters</td>
<td>3</td>
</tr>
<tr>
<td>ELE/N3101</td>
<td>Engage with customer for service</td>
<td>5</td>
</tr>
<tr>
<td>ELE/N3112</td>
<td>Perform installation and repair of refrigerator</td>
<td>9</td>
</tr>
<tr>
<td>ELE/N3114</td>
<td>Perform installation and repair of air conditioners</td>
<td>17</td>
</tr>
<tr>
<td>ELE/N3116</td>
<td>Perform installation and repair of washing machine</td>
<td>24</td>
</tr>
<tr>
<td>ELE/N9905</td>
<td>Work effectively at the workplace</td>
<td>32</td>
</tr>
<tr>
<td>ELE/N1002</td>
<td>Apply health and safety practices at the workplace</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Assessment Guidelines and Weightage</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td><strong>Assessment Guidelines</strong></td>
<td>47</td>
</tr>
<tr>
<td></td>
<td><strong>Assessment Weightage</strong></td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>Acronyms</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Glossary</td>
<td>50</td>
</tr>
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</table>
ELE/Q3105: Field Engineer RACW

Brief Job Description

The individual interacts with customers to install the appliance, diagnose the problem to assess possible causes of malfunction, rectifies minor problems, and replaces faulty modules for failed parts or recommends factory repairs for bigger faults.

Personal Attributes

The individual must be willing to work in the field and travel through the day from one customer's premise to another. The individual must also possess important attributes such as punctuality, amenable behaviour, patience, good interpersonal relationship building, trustworthiness, integrity, and critical thinking.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ELE/N3101: Engage with customer for service
2. ELE/N3112: Perform installation and repair of refrigerator
3. ELE/N3114: Perform installation and repair of air conditioners
4. ELE/N3116: Perform installation and repair of washing machine
5. ELE/N9905: Work effectively at the workplace
6. ELE/N1002: Apply health and safety practices at the workplace

Qualification Pack (QP) Parameters

<table>
<thead>
<tr>
<th>Sector</th>
<th>Electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Sector</td>
<td>Consumer Electronics &amp; IT Hardware</td>
</tr>
<tr>
<td>Occupation</td>
<td>After Sales Service</td>
</tr>
<tr>
<td>Country</td>
<td>India</td>
</tr>
<tr>
<td>NSQF Level</td>
<td>5</td>
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<tr>
<td>Aligned to NCO/ISCO/ISIC Code</td>
<td>NCO-2015/NIL</td>
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</table>
### Minimum Educational Qualification & Experience

- Diploma ((Electrical or Electronics Engineering) with 2 Years of Relevant experience)
- OR
- B.E./B.Tech (Degree in Electrical or Electronics Engineering)
- OR
- Certificate (NSQF Level-4 in Field Technician - Air Conditioner with 2 years of relevant Experience)

### Minimum Level of Education for Training in School
Not Applicable

### Pre-Requisite License or Training
NA

### Minimum Job Entry Age
18 Years

### Last Reviewed On
27/01/2022

### Next Review Date
02/06/2025

### Deactivation Date
02/06/2025

### NSQC Approval Date
27/01/2022

### Version
2.0

### Reference code on NQR
2022/EHW/ESSC/05112

### NQR Version
1.0

### Remarks:
NA
ELE/N3101: Engage with customer for service

Description

This NOS unit is about interacting with customer to understand their requirement with respect to problem in the appliance

Scope

The scope covers the following:

- Interact with customer
- Suggest possible solutions

Elements and Performance Criteria

Interacting with customer

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

- **PC1.** Analyse the details of customer complaint registered at customer care or installation schedule
- **PC2.** Connect with the customer to confirm problem telephonically and fix time for visit
- **PC3.** Collect appropriate tools, parts, relevant reference sheets, manuals and documents
- **PC4.** Visit the customer premises as per the scheduled date and time for service as per the requirement
- **PC5.** Check about warranty status of appliance and annual maintenance contract
- **PC6.** Gather detailed information pertaining to age of appliance, status of upkeep, symptoms and history of problems in the appliance
- **PC7.** Provide information to the customer about the warranty and problem in detail along with the precautions to be taken in order to avoid recurrence of problem

Suggest possible solutions

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

- **PC8.** Suggest possible solutions with the time required, costs involved and methodology for servicing
- **PC9.** Seek customer’s approval on further action

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- **KU1.** Company’s policies on code of conduct, organisation's culture, customer care, reporting structure and documentation policy
- **KU2.** Company’s products and recurring problems reported in consumer appliances
- **KU3.** Precautions to be taken while handling field calls and dealing with customers
- **KU4.** Importance of personal grooming with proper etiquettes at the customer's premises
- **KU5.** Basic electrical, mechanical modules of various appliances and electronics involved in the type of appliance
KU6. models of different appliances, their common and distinguishing features, functionality of different features of appliances and new features

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. complete required documentation
GS2. seek inputs and guidance from the supervisor
GS3. read and comprehend documents
GS4. communicate in local/regional/English language
GS5. comply with applicable standard operating procedures
GS6. communicate with all stakeholders to be able to work efficiently
GS7. interact with others in a polite and courteous manner
GS8. maintain proper etiquette while dealing with the customer
### Assessment Criteria for Outcomes

<table>
<thead>
<tr>
<th>Assessment Criteria for Outcomes</th>
<th>Theory Marks</th>
<th>Practical Marks</th>
<th>Project Marks</th>
<th>Viva Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interacting with customer</strong></td>
<td>32</td>
<td>41</td>
<td>-</td>
<td>8</td>
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<tr>
<td>PC1. analyse the details of customer complaint registered at customer care or installation schedule</td>
<td>5</td>
<td>6</td>
<td>-</td>
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<tr>
<td>PC2. connect with the customer to confirm problem telephonically and fix time for visit</td>
<td>4</td>
<td>6</td>
<td>-</td>
<td>1</td>
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<tr>
<td>PC3. collect appropriate tools, parts, relevant reference sheets, manuals and documents</td>
<td>4</td>
<td>6</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>PC4. visit the customer premises as per the scheduled date and time for service as per the requirement</td>
<td>4</td>
<td>6</td>
<td>-</td>
<td>1</td>
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<tr>
<td>PC5. check about warranty status of appliance and annual maintenance contract</td>
<td>4</td>
<td>6</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PC6. gather detailed information pertaining to age of appliance, status of upkeep, symptoms and history of problems in the appliance</td>
<td>5</td>
<td>6</td>
<td>-</td>
<td>1</td>
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<tr>
<td>PC7. provide information to the customer about the warranty and problem in detail along with the precautions to be taken in order to avoid recurrence of problem</td>
<td>6</td>
<td>5</td>
<td>-</td>
<td>1</td>
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<tr>
<td><strong>Suggest possible solutions</strong></td>
<td>8</td>
<td>9</td>
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<tr>
<td>PC8. suggest possible solutions with the time required, costs involved and methodology for servicing</td>
<td>4</td>
<td>5</td>
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<td>PC9. seek customer’s approval on further action</td>
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### National Occupational Standards (NOS) Parameters

<table>
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<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
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<tr>
<td>NOS Code</td>
<td>ELE/N3101</td>
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<td>NOS Name</td>
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<td>Electronics</td>
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<td>Consumer Electronics &amp; IT Hardware</td>
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<td>AFTER SALES SERVICE</td>
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<td>Last Reviewed Date</td>
<td>27/01/2022</td>
</tr>
<tr>
<td>Next Review Date</td>
<td>02/06/2025</td>
</tr>
<tr>
<td>NSQC Clearance Date</td>
<td>27/01/2022</td>
</tr>
</tbody>
</table>
ELE/N3112: Perform installation and repair of refrigerator

Description

This NOS unit is about installation of newly purchased refrigerator at customer location and repair in case of any dysfunction.

Scope

The scope covers the following:

- This unit/ task covers the following:
  - Prepare for installation of refrigerator
  - Install refrigerator at customer location
  - Diagnose, repair and replace the dysfunctional module of refrigerator
  - Complete documentation
  - Coordinate with others w.r.t. installation and repair

Elements and Performance Criteria

Prepare for installation of refrigerator

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

PC1. identify work requirement from superior on regular basis
PC2. visit customer location as scheduled
PC3. provide guidance to the customer for pre-installation requirement as per the appliance w.r.t platform for placing the appliance, plug point, etc.
PC4. remove the packaging from the appliance delivered at the customer location
PC5. verify that the product matches the customer’s order in terms of colour, model etc. with all supporting accessories
PC6. check the availability of all tools and fitments for the installation
PC7. clear up the packaging material waste and dispose as per company’s norms
PC8. seek customer’s input on placing/positioning the appliance near a plug point, in obstruction-free area, while maintaining the required distance from wall and floor

Install refrigerator at customer location

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

PC9. perform steps to fit water-disposal beaker, handle, shelves, basket and side buckets
PC10. connect the refrigerator to power supply and set cooling/freezer temperature knobs according to the season so as to demonstrate features/utility
PC11. inform the customer about the precautions to be taken while using the refrigerator and heating of outside walls of the refrigerator
PC12. explain maintenance procedures to be followed while using the refrigerator

Diagnose, repair and replace the dysfunctional module of refrigerator

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

PC13. verify thermostat settings to ensure they are as required
PC14. diagnose the fault based on customer interaction, usage pattern and initial inspection
PC15. unplug the appliance to carry out further inspection
PC16. perform basic tests such as power supply inspection, volt ampere test and earth test power supply
PC17. inspect every module of the unit separately if the fault is not identified through basic tests such as compressor, motors, PCB, condenser optimise the time taken to fix the dysfunctional refrigerator
PC18. send it to factory for in-depth diagnosis if problem does not get identified at site
PC19. repair/replace component at location, if the fault identified is due to damage of components
PC20. schedule next appointment if the part can't be replaced on site
PC21. reassemble the unit to check that all the modules of the unit are working as per specifications
PC22. demonstrate functionality of the unit to the customer
PC23. provide information to the customer about cleaning procedures and precautions to be taken in order to avoid recurrence of problem
PC24. sell related products such as new equipment or annual maintenance contracts (AMC) to the customer

Complete documentation
To be competent, the user/individual on the job must be able to:
PC25. fill in customer acknowledgement form and get it signed by customer, both in case of installation and repair
PC26. document the work completed on the company ERP software for tracking and inform customer care as well as supervisor about job completion
PC27. complete all documentation procedures for complaint closure
PC28. collect necessary payments from the customer and issue invoice accordingly

Coordinate with others w.r.t. installation and repair
To be competent, the user/individual on the job must be able to:
PC29. escalate customer issues and problems that are unresolved at field level, including queries on non-field service areas
PC30. interact with service technicians from time to time in order to understand problems faced on the field
PC31. provide training to junior level technicians about installation procedures, diagnosis procedures and customer handling

Knowledge and Understanding (KU)
The individual on the job needs to know and understand:

KU1. company’s policy on product’s warranty, sales, installation, after sales support policy and other terms and conditions
KU2. different types of refrigerators such as traditional, frost-free, peltier with all features and functionalities of various models
KU3. refrigerator manufacturing capabilities of the organisation, models of the company and their respective features
KU4. installation-site requirements such as structural requirements, ventilation, etc.
KU5. damage free handling of the unit
KU6. refrigeration cycle and functioning of the appliance and its various modules, including various electromechanical parts of the refrigerator
KU7. method of refrigeration, its use and functioning of refrigerator sealed system
KU8. types of refrigerants such as R12, R22, R134a, R290, R600a, R410, R32, use of different brazing sticks, types of brazing torches, fluxes and their application
KU9. manual-based procedure of installing the refrigerators
KU10. methods of fixing various accessories, parts that have accompanied the unit and their features
KU11. how to use the appliance and its various features/functionalities after installation
KU12. use of test equipment and tools such as multi-meter, oscilloscope etc.
KU13. safety precautions/rules, policies, procedures and quality standards to be followed
KU14. fundamentals of electricity such as ohms law, difference between ac and dc, understanding of domestic wiring, understanding of series and parallel connections
KU15. how to rectify so as to avoid repeat fault in the refrigerator
KU16. selection of appropriate spares for replacement
KU17. basic knowledge of components such as diode, transformer, LED, photo transistor, capacitor, thermistor ICs etc.
KU18. components/modules of refrigerators and their prices
KU19. packaging waste disposal procedures
KU20. refrigerator energy ratings such as BEE rating
KU21. troubleshooting knowledge with respect to refrigerators
KU22. hazards, their causes and prevention/personal safety
KU23. frequently occurring faults such as noise, water dripping and insufficient cooling, their causes and solutions
KU24. other products of the company

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. complete forms and other documentation
GS2. read and comprehend text material
GS3. listen attentively
GS4. communicate in local/regional/English language
GS5. interact with others in a polite and courteous manner
GS6. comply with applicable standard operating procedures
GS7. communicate with all stakeholders to be able to work efficiently
GS8. seek inputs and guidance from the supervisor
GS9. maintain proper etiquette while dealing with the customer
GS10. interpret information clearly
GS11. improve work processes
GS12. ensure customer satisfaction
GS13. work effectively to achieve daily target
## Assessment Criteria

<table>
<thead>
<tr>
<th>Assessment Criteria for Outcomes</th>
<th>Theory Marks</th>
<th>Practical Marks</th>
<th>Project Marks</th>
<th>Viva Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prepare for installation of refrigerator</strong></td>
<td>12</td>
<td>12</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PC1. identify work requirement from superior on regular basis</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC2. visit customer location as scheduled</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC3. provide guidance to the customer for pre-installation requirement as per the appliance w.r.t platform for placing the appliance, plug point, etc.</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PC4. remove the packaging from the appliance delivered at the customer location</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC5. verify that the product matches the customer’s order in terms of colour, model etc. with all supporting accessories</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PC6. check the availability of all tools and fitments for the installation</td>
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<td>3</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PC7. clear up the packaging material waste and dispose as per company’s norms</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC8. seek customer’s input on placing/positioning the appliance near a plug point, in obstruction-free area, while maintaining the required distance from wall and floor</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Install refrigerator at customer location</strong></td>
<td>5</td>
<td>5</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PC9. perform steps to fit water-disposal beaker, handle, shelves, basket and side buckets</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC10. connect the refrigerator to power supply and set cooling/freezer temperature knobs according to the season so as to demonstrate features/utility</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PC11. inform the customer about the precautions to be taken while using the refrigerator and heating of outside walls of the refrigerator</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PC12. explain maintenance procedures to be followed while using the refrigerator</td>
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<td>-</td>
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</tr>
<tr>
<td>Assessment Criteria for Outcomes</td>
<td>Theory Marks</td>
<td>Practical Marks</td>
<td>Project Marks</td>
<td>Viva Marks</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>-----------------</td>
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<tr>
<td>Diagnose, repair and replace the dysfunctional module of refrigerator</td>
<td>11</td>
<td>16</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>PC13. verify thermostat settings to ensure they are as required</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC14. diagnose the fault based on customer interaction, usage pattern and initial inspection</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PC15. unplug the appliance to carry out further inspection</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC16. perform basic tests such as power supply inspection, volt ampere test and earth test power supply</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PC17. inspect every module of the unit separately if the fault is not identified through basic tests such as compressor, motors, PCB, condenser optimise the time taken to fix the dysfunctional refrigerator</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>1</td>
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<tr>
<td>PC18. send it to factory for in-depth diagnosis if problem does not get identified at site</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC19. repair/replace component at location, if the fault identified is due to damage of components</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PC20. schedule next appointment if the part can't be replaced on site</td>
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<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC21. reassemble the unit to check that all the modules of the unit are working as per specifications</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PC22. demonstrate functionality of the unit to the customer</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PC23. provide information to the customer about cleaning procedures and precautions to be taken in order to avoid recurrence of problem</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC24. sell related products such as new equipment or annual maintenance contracts (AMC) to the customer</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Complete documentation</td>
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### Assessment Criteria for Outcomes

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<tr>
<th>Description</th>
<th>Theory Marks</th>
<th>Practical Marks</th>
<th>Project Marks</th>
<th>Viva Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC25. fill in customer acknowledgement form and get it signed by customer, both in case of installation and repair</td>
<td>2</td>
<td>2</td>
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<td>PC26. document the work completed on the company ERP software for tracking and inform customer care as well as supervisor about job completion</td>
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<td>3</td>
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<td>PC27. complete all documentation procedures for complaint closure</td>
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<td>2</td>
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<tr>
<td>PC28. collect necessary payments from the customer and issue invoice accordingly</td>
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<tr>
<td><strong>Coordinate with others w.r.t. installation and repair</strong></td>
<td>7</td>
<td>10</td>
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<td>PC29. escalate customer issues and problems that are unresolved at field level, including queries on non-field service areas</td>
<td>2</td>
<td>2</td>
<td>-</td>
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<td>PC30. interact with service technicians from time to time in order to understand problems faced on the field</td>
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<td>4</td>
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<td>PC31. provide training to junior level technicians about installation procedures, diagnosis procedures and customer handling</td>
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<td>4</td>
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## National Occupational Standards (NOS) Parameters

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<th>Specification</th>
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<td>ELE/N3112</td>
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<td>Perform installation and repair of refrigerator</td>
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<td>Consumer Electronics &amp; IT Hardware</td>
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<td>Occupation</td>
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<td>27/01/2022</td>
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ELE/N3114: Perform installation and repair of air conditioners

Description

This NOS is about understanding the installation or repair requirements for air conditioners, perform the tasks at customer premises to achieve the required productivity and quality.

Scope

The scope covers the following:

- This unit/task covers the following:
  - Perform pre-installation checks
  - Install the air conditioner
  - Analyze symptoms, identify and rectify faults
  - Complete documentation

Elements and Performance Criteria

**Perform pre-installation checks**

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

PC1. analyze the work requirements by interacting with the supervisor

PC2. plan to visit customer premises to understand the installation position of air conditioner such as window, split, high, low, etc

PC3. check that the location meets structural requirements such as distance from power supply, distance from windows/doors being opened frequently

PC4. inform customer about any pre installations/masonry/electrical work to be carried out

PC5. mark position for placement of indoor/outdoor units to get customer confirmation on position and installation on next visit

**Install the air conditioner**

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

PC6. remove the air conditioner packaging without causing any damage and ensure that it matches the customer order in terms of colour

PC7. check that all supporting accessories are available in the pack

PC8. inspect that tools and fitments required for the installation are available

PC9. dispose off the packaging material waste as per company’s norms

PC10. measure the location to drill holes ensuring that no internal wiring damage takes place

PC11. mount the indoor unit and ensure that the screws are fastened securely

PC12. place the outdoor unit at a suitable location and attach it firmly to wall/floor

PC13. connect the indoor and the outdoor units using the field copper pipe of appropriate size and interconnecting cables

PC14. fill in additional gas if the distance between the indoor and the outdoor units is more than what is recommended
PC15. align the air conditioner as per the instructions manual and make necessary power supply connections

PC16. demonstrate the features/utility to customer for the new installation while explaining the precautions to be taken while using the air conditioner

Analyze symptoms, identify and rectify faults
To be competent, the user/individual on the job must be able to:

PC17. analyze usage pattern of the air conditioner from the customer

PC18. diagnose the fault based on customer interaction and initial inspection by carrying out basic tests such as power supply inspection, volt ampere test, etc.

PC19. separate and inspect every module of the unit if the fault is not identified through basic tests

PC20. plan to send air conditioner to factory for in-depth diagnosis, if problem cannot be identified at site

PC21. repair or replace faulty part as per requirement at customer location or send it to service center on time in case immediate repair is not possible for specialized parts such as PCB

PC22. plan second visit to replace dysfunctional module/part after collecting it from service center

PC23. carry out brazing operation at the customer premise or pass the complaint on to a specialist in-charge of handling brazing, if the fault identified is a gas leak

PC24. reassemble the unit after rectifying identified fault

PC25. check that all the modules of the unit work as per specifications and confirm functionality to the customer

PC26. collect necessary payment from the customer as per rate sheet/ communication from customer care and provide the receipt

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

PC27. fill in customer acknowledgement form and seek customer’s signature

PC28. complete documentation for recording installation/repair of air conditioner and update the company ERP software for tracking/future references

PC29. inform customer care and supervisor about job completion

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. safety rules, policies, procedures and quality standards to be followed

KU2. installation-site requirements such as structural requirements, ventilation, etc.

KU3. manual-based procedure of installing the air conditioner

KU4. how to fix various accessories and parts that have accompanied the unit

KU5. how to operate tools such as screw drivers, electric drill for installation

KU6. packaging waste disposal procedures

KU7. how to operate the air conditioner and use the various features

KU8. method of air conditioning, its use and functioning of sealed system

KU9. troubleshooting knowledge with respect to air conditioners
KU10. frequently occurring faults such as poor/no cooling, noisy unit, condensation water over flowing and basic electrical faults such as improper/no earthing, defective power cord, etc.

KU11. basic electrical and mechanical modules of air conditioner

KU12. usage of test equipment and tools such as multi-meter, oscilloscope, temperature meter, pressure gauges, etc.

KU13. how to detect defects in the compressor, condenser and other problems such as improper alignment of unit, low refrigerant charge, etc. along with their reasons

KU14. how to diagnose reasons for improper cooling by diagnosing causes such as dirty filter, blocked coil, bent fins, improper damper setting, low capacity of unit, etc.

KU15. fundamentals of electricity such as ohms law, difference between ac and dc, etc., basic electronic components such as diode, transformer, LED, photo transistor, etc., electrical and electronic symbols, multiples and SI units

KU16. basics of types of refrigerants such as R12, R22, R134a, R290, R600a, R410, R32

KU17. use of different brazing sticks, types of brazing torches, types of fluxes and their application

KU18. how to document completion note for customer

KU19. how to record completion information in the ERP system

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and comprehend documentation

GS2. communicate with the customer in a polite and courteous manner

GS3. anticipate and avoid hazards that may occur while carrying out the work

GS4. how to operate computers and software installed

GS5. work effectively to reduce repetition of errors

GS6. improve work processes

GS7. write in local/English language clearly

GS8. co-ordinate with different departments as per the requirement
## Assessment Criteria

<table>
<thead>
<tr>
<th>Assessment Criteria for Outcomes</th>
<th>Theory Marks</th>
<th>Practical Marks</th>
<th>Project Marks</th>
<th>Viva Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perform pre-installation checks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC1. analyze the work requirements by interacting with the supervisor</td>
<td>2</td>
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<tr>
<td>PC2. plan to visit customer premises to understand the installation position of air conditioner such as window, split, high, low, etc</td>
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<tr>
<td>PC3. check that the location meets structural requirements such as distance from power supply, distance from windows/doors being opened frequently</td>
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<tr>
<td>PC4. inform customer about any pre installations/masonry/electrical work to be carried out</td>
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<tr>
<td>PC5. mark position for placement of indoor/outdoor units to get customer confirmation on position and installation on next visit</td>
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<tr>
<td><strong>Install the air conditioner</strong></td>
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<tr>
<td>PC6. remove the air conditioner packaging without causing any damage and ensure that it matches the customer order in terms of colour</td>
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<tr>
<td>PC7. check that all supporting accessories are available in the pack</td>
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<tr>
<td>PC8. inspect that tools and fitments required for the installation are available</td>
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<td>PC9. dispose off the packaging material waste as per company’s norms</td>
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<td>PC10. measure the location to drill holes ensuring that no internal wiring damage takes place</td>
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<td>2</td>
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<tr>
<td>PC11. mount the indoor unit and ensure that the screws are fastened securely</td>
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<td>2</td>
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<tr>
<td>PC12. place the outdoor unit at a suitable location and attach it firmly to wall/floor</td>
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<td>2</td>
<td>-</td>
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<tr>
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<td>---------------------------------</td>
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<tr>
<td>PC13. connect the indoor and the outdoor units using the field copper pipe of appropriate size and interconnecting cables</td>
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<td>3</td>
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<tr>
<td>PC14. fill in additional gas if the distance between the indoor and the outdoor units is more than what is recommended</td>
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<td>PC15. align the air conditioner as per the instructions manual and make necessary power supply connections</td>
<td>2</td>
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<tr>
<td>PC16. demonstrate the features/utility to customer for the new installation while explaining the precautions to be taken while using the air conditioner</td>
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<td><em>Analyze symptoms, identify and rectify faults</em></td>
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<tr>
<td>PC17. analyze usage pattern of the air conditioner from the customer</td>
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<tr>
<td>PC18. diagnose the fault based on customer interaction and initial inspection by carrying out basic tests such as power supply inspection, volt ampere test, etc.</td>
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<tr>
<td>PC19. separate and inspect every module of the unit if the fault is not identified through basic tests</td>
<td>1</td>
<td>2</td>
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<tr>
<td>PC20. plan to send air conditioner to factory for in-depth diagnosis, if problem cannot be identified at site</td>
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<tr>
<td>PC21. repair or replace faulty part as per requirement at customer location or send it to service center on time in case immediate repair is not possible for specialized parts such as PCB</td>
<td>1</td>
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<tr>
<td>PC22. plan second visit to replace dysfunctional module/part after collecting it from service center</td>
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<td>PC23. carry out brazing operation at the customer premise or pass the complaint on to a specialist in-charge of handling brazing, if the fault identified is a gas leak</td>
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<td>----------------------------------</td>
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<td>PC24. reassemble the unit after rectifying identified fault</td>
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<td>PC25. check that all the modules of the unit work as per specifications and confirm functionality to the customer</td>
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<td>PC26. collect necessary payment from the customer as per rate sheet/ communication from customer care and provide the receipt</td>
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<td>Complete documentation</td>
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<td>PC27. fill in customer acknowledgement form and seek customer’s signature</td>
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<td>PC28. complete documentation for recording installation/repair of air conditioner and update the company ERP software for tracking/future references</td>
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# National Occupational Standards (NOS) Parameters

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<th>Description</th>
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<td>NOS Name</td>
<td>Perform installation and repair of air conditioners</td>
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<td>Sector</td>
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ELE/N3116: Perform installation and repair of washing machine

Description

This NOS unit is about installation of newly purchased appliance washing machine at customer location and repair in case of any dysfunction.

Scope

The scope covers the following:

- Prepare for installation of washing machine
- Install washing machine at customer location
- Diagnose, repair and replace the faulty module of appliance
- Complete documentation
- Coordinate with others w.r.t. installation and repair

Elements and Performance Criteria

Prepare for installation of washing machine

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

PC1. identify work requirement from the superior
PC2. visit customer location as scheduled
PC3. provide guidance to the customer for pre-installation requirement as per the appliance w.r.t structure, plug point, drainage, plumbing etc.
PC4. remove the packaging from the appliance delivered at the customer location
PC5. verify that the product matches the customer's order in terms of colour, model etc. along with all supporting accessories
PC6. check the availability of all tools and fitments for the installation
PC7. clear up the packaging material waste and dispose as per company's norms
PC8. seek customer's input on placing/positioning the appliance near a plug point, in obstruction-free area, while maintaining the required distance from water tank
PC9. position the washing machine on appropriate platform as per location guidelines given in the installation manual

Install washing machine at customer location

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

PC10. remove all transport pins or anything lying in the drum of the washing machine before starting the machine
PC11. check the necessary plumbing installations required for water inlet and outlet
PC12. connect the machine's drain hose with the sewage pipe to ensure proper drainage
PC13. identify the water inlet valve in the household plumbing
PC14. ensure that the valve is turned off while connecting the PVC hose water inlet of the washing machine to the valve
PC15. connect the waste water outlet from the washing machine to the waste system such that the dirty water does not get siphoned back into the washing machine

PC16. perform steps to make inlet, outlet and power supply connections securely using the correct tools and equipment for installation

PC17. operate and check that there are no leaks and the machine is in a safe and stable condition

PC18. educate the customer about switching off the unit during voltage fluctuations and use of voltage regulators, if necessary

PC19. provide information to the customer on proper operation and maintenance procedures

Diagnose, repair and replace the faulty module of appliance

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

PC20. diagnose the fault based on customer interaction, usage pattern and initial inspection

PC21. unplug the appliance to carry out further inspection

PC22. perform basic tests such as power supply inspection, volt ampere test and earth test power supply

PC23. inspect every module of the unit separately if the fault is not identified through basic tests

PC24. send it to factory for in-depth diagnosis if problem does not get identified at site

PC25. repair/replace component at location, if the fault identified is due to damage of components

PC26. schedule next appointment if the part can't be replaced on site

PC27. reassemble the unit to check that all the modules of the unit are working as per specifications

PC28. demonstrate functionality of the unit to the customer

PC29. provide information to the customer about cleaning procedures and precautions to be taken in order to avoid recurrence of problem

Complete documentation

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

PC30. fill in customer acknowledgement form and get it signed by customer, both in case of installation and repair

PC31. document the work completed on the company ERP software for tracking and inform customer care as well as supervisor about job completion

PC32. complete all documentation procedures for complaint closure

PC33. collect necessary payments from the customer and issue invoice accordingly

Coordinate with others w.r.t. installation and repair

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

PC34. escalate customer issues and problems that are unresolved at field level, including queries on non-field service areas

PC35. interact with service technicians from time to time in order to understand problems faced on the field

PC36. provide training to junior level technicians about installation procedures, diagnosis procedures and customer handling

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:
KU1. company’s policy on product’s warranty, sales, installation, after sales support policy and other terms and conditions
KU2. installation site requirements (structural requirements, ventilation, etc.) with all safety precautions to be taken while installing washing machine
KU3. different types of washing machines such as front load and top load their features and functionalities
KU4. controls, features and functionalities of various washing machine models of the company
KU5. safety precautions/rules, policies, procedures and quality standards to be followed
KU6. manual-based procedure of installing the washing machine
KU7. methods of fixing various accessories, parts that have accompanied the washing machine
KU8. packaging waste disposal procedures
KU9. how to use the appliance and its various features,functionalities after installation
KU10. use of test equipment and tools such as multi-meter, oscilloscope etc.
KU11. damage free handling of the unit
KU12. different cycles in the machine running process and possible symptoms of faults in respective cycles
KU13. fundamentals of electricity such as ohms law, difference between ac and dc, understanding of domestic wiring, series and parallel connections
KU14. fundamentals of motors, types of motors and their working methods
KU15. basic knowledge of components such as diode, transformer, LED, photo transistor, capacitor, thermistor ICs etc. and functioning of components and parts such as solenoids and plungers
KU16. basics of gears, behaviour of gear mechanism, understanding of linear and angular movements, concepts such as rpm, torque etc.
KU17. types of switches such as thermal, mechanical, electronic, magnetic, electromagnetic, electromechanical, pressure optical and bimetal
KU18. troubleshooting knowledge with respect to washing machine
KU19. causes and solutions of faults common to all types of washing machines, faults specific to different models and frequently occurring faults such as noise, water not filling/over filling, water not draining
KU20. components/modules of the washing machine and their prices
KU21. hazards, their causes and prevention/personal safety
KU22. other products of the company

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. complete forms and other documentation
GS2. read and comprehend text material
GS3. listen carefully while interacting with others
GS4. communicate in local/regional/English language
GS5. interact with others in a polite and courteous manner
GS6. comply with applicable standard operating procedures
GS7. communicate with all stakeholders to be able to work efficiently
GS8. seek inputs and guidance from the supervisor
GS9. maintain proper etiquette while dealing with the customer
GS10. interpret information clearly
GS11. improve work processes
### Assessment Criteria

<table>
<thead>
<tr>
<th>Assessment Criteria for Outcomes</th>
<th>Theory Marks</th>
<th>Practical Marks</th>
<th>Project Marks</th>
<th>Viva Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prepare for installation of washing machine</strong></td>
<td>11</td>
<td>11</td>
<td>-</td>
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</tr>
<tr>
<td>PC1. identify work requirement from the superior</td>
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<td>-</td>
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</tr>
<tr>
<td>PC2. visit customer location as scheduled</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>PC3. provide guidance to the customer for pre-installation requirement as per the appliance w.r.t structure, plug point, drainage, plumbing etc.</td>
<td>2</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PC4. remove the packaging from the appliance delivered at the customer location</td>
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<td>2</td>
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<td>-</td>
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<tr>
<td>PC5. verify that the product matches the customer’s order in terms of colour, model etc. along with all supporting accessories</td>
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<td>2</td>
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<tr>
<td>PC6. check the availability of all tools and fitments for the installation</td>
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<td>3</td>
<td>-</td>
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<tr>
<td>PC7. clear up the packaging material waste and dispose as per company’s norms</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC8. seek customer’s input on placing/positioning the appliance near a plug point, in obstruction-free area, while maintaining the required distance from water tank</td>
<td>1</td>
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<td>-</td>
<td>1</td>
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<tr>
<td>PC9. position the washing machine on appropriate platform as per location guidelines given in the installation manual</td>
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<td><strong>Install washing machine at customer location</strong></td>
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<td>PC10. remove all transport pins or anything lying in the drum of the washing machine before starting the machine</td>
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<td>PC11. check the necessary plumbing installations required for water inlet and outlet</td>
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<tr>
<td>PC12. connect the machine's drain hose with the sewage pipe to ensure proper drainage</td>
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</table>
## Assessment Criteria for Outcomes

<table>
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<tbody>
<tr>
<td>PC13. identify the water inlet valve in the household plumbing</td>
<td>1</td>
<td>1</td>
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</tr>
<tr>
<td>PC14. ensure that the valve is turned off while connecting the PVC hose water inlet of the washing machine to the valve</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC15. connect the waste water outlet from the washing machine to the waste system such that the dirty water does not get siphoned back into the washing machine</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>PC16. perform steps to make inlet, outlet and power supply connections securely using the correct tools and equipment for installation</td>
<td>1</td>
<td>3</td>
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</tr>
<tr>
<td>PC17. operate and check that there are no leaks and the machine is in a safe and stable condition</td>
<td>1</td>
<td>1</td>
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</tr>
<tr>
<td>PC18. educate the customer about switching off the unit during voltage fluctuations and use of voltage regulators, if necessary</td>
<td>1</td>
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<tr>
<td>PC19. provide information to the customer on proper operation and maintenance procedures</td>
<td>2</td>
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<tr>
<td><strong>Diagnose, repair and replace the faulty module of appliance</strong></td>
<td>9</td>
<td>14</td>
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<tr>
<td>PC20. diagnose the fault based on customer interaction, usage pattern and initial inspection</td>
<td>1</td>
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<tr>
<td>PC21. unplug the appliance to carry out further inspection</td>
<td>1</td>
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<tr>
<td>PC22. perform basic tests such as power supply inspection, volt ampere test and earth test power supply</td>
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<td>PC23. inspect every module of the unit separately if the fault is not identified through basic tests</td>
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<tr>
<td>PC24. send it to factory for in-depth diagnosis if problem does not get identified at site</td>
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<td>PC25. repair/replace component at location, if the fault identified is due to damage of components</td>
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<td>Assessment Criteria for Outcomes</td>
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<td>Project Marks</td>
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<tr>
<td>PC26. schedule next appointment if the part can't be replaced on site</td>
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<td>PC27. reassemble the unit to check that all the modules of the unit are working as per specifications</td>
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<tr>
<td>PC28. demonstrate functionality of the unit to the customer</td>
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<tr>
<td>PC29. provide information to the customer about cleaning procedures and precautions to be taken in order to avoid recurrence of problem</td>
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<tr>
<td><strong>Complete documentation</strong></td>
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<tr>
<td>PC30. fill in customer acknowledgement form and get it signed by customer, both in case of installation and repair</td>
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<tr>
<td>PC31. document the work completed on the company ERP software for tracking and inform customer care as well as supervisor about job completion</td>
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<td>PC32. complete all documentation procedures for complaint closure</td>
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<td>PC33. collect necessary payments from the customer and issue invoice accordingly</td>
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<td><strong>Coordinate with others w.r.t. installation and repair</strong></td>
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<td>PC34. escalate customer issues and problems that are unresolved at field level, including queries on non-field service areas</td>
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<td>PC35. interact with service technicians from time to time in order to understand problems faced on the field</td>
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<td>PC36. provide training to junior level technicians about installation procedures, diagnosis procedures and customer handling</td>
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### National Occupational Standards (NOS) Parameters

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<td>Consumer Electronics &amp; IT Hardware</td>
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<td>After Sales Service</td>
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ELE/N9905: Work effectively at the workplace

Description

This unit is about the communicating and managing work effectively at the workplace as well as taking measures to enhance own competence and working in a disciplined and ethical manner.

Scope

The scope covers the following:

- Communicate effectively at the workplace
- Work effectively
- Maintain and enhance professional competence
- Work in a disciplined and ethical manner
- Uphold social diversity at the workplace

Elements and Performance Criteria

**Communicate effectively at the workplace**

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

PC1. exchange information and instruction with colleagues, and seek clarifications and feedback as necessary

PC2. assist colleagues where required

PC3. follow business communication etiquette in all interactions and communicative formats (online, digital, and in-person)

PC4. document and share all relevant information with stakeholders in agreed formats and as per agreed timelines

**Work effectively**

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

PC5. identify and obtain clarity regarding organisational, team and own goals and targets

PC6. prioritise and plan work in order to achieve goals and targets

PC7. monitor own and team performance as per agreed plan

PC8. complete duties accurately, systematically and within required timeframes

PC9. express emotions appropriately at the workplace and manage own response to heightened emotions

PC10. maintain orderliness and cleanliness in the work area

**Maintain and enhance professional competence**

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

PC11. identify own strengths and weaknesses in relation to goals and targets

PC12. adapt self, service, or product to meet success criteria

PC13. seek and select opportunities for continuous professional development

PC14. formulate a professional development plan to enhance capabilities
PC15. build or contribute to the organizational knowledge base of cases, clients, issues, solutions, and innovations
PC16. examine developments and trends in field of work and their potential impact on work
PC17. take feedback from peers, supervisors and clients to improve own performance and practices

Work in a disciplined and ethical manner

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

PC18. perform tasks as per workplace standards, organisational policies and legislative requirements
PC19. display appropriate professional appearance at the workplace and adhere to the organisational dress code
PC20. demonstrate responsible and disciplined behaviour at the workplace such as punctuality; completing tasks as per given time and standards; demonstrating professional behaviour at all times, adopting environment-friendly practices, etc.
PC21. identify the cause of conflict and options for resolution with peers or escalate grievances and problems to appropriate authority as per procedure for conflict resolution
PC22. protect the rights of the client and organisation when delivering services
PC23. ensure services are delivered equally to all clients regardless of personal and cultural beliefs
PC24. operate within an agreed ethical code of practice and report unethical conduct to the appropriate authorities
PC25. follow organisational guidelines and legal requirements on disclosure and confidentiality

Uphold social diversity at the workplace

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

PC26. recognize and evaluate biased practices against underrepresented groups like women and persons with disabilities, in workplace systems and processes
PC27. identify and report discrimination and harassment based on gender, disability, or cultural difference at the workplace
PC28. use inclusive or neutral language and gestures in all interactions
PC29. respect the personal and professional space of others
PC30. access grievance redressal mechanisms as per legislations

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation’s policies on dress code, workplace timings, workplace behaviour, performance management, incentives, delivery standards, information security, etc.
KU2. organizational hierarchy and escalation matrix
KU3. importance of the individual’s role in the workflow
KU4. organisational norms on health, safety and sustainability
KU5. work area inspection procedures and practices
KU6. professional etiquette and grooming
KU7. communication etiquette across communicative mediums (online, digital, and in-person) including strategies/methods for sharing information, documentation, and providing and receiving feedback

KU8. importance of self-evaluations and developing a continuous learning and professional development plan

KU9. developments and trends impacting professional practice

KU10. importance of taking and using feedback from colleagues and clients to identify and introduce improvements in work performance

KU11. professional ethics and workplace norms on reporting and/or penalizing unethical behaviour and practices.

KU12. guidelines and legal requirements on disclosure, confidentiality, and conflicts of interest

KU13. strategies for collaboration with colleagues and clients.

KU14. professional responses and strategies against inappropriate language or behaviour toward self and others

KU15. Implicit bias (based on gender, disability, class, caste, colour, race, culture, religion, etc.) and its consequences in the workplace

KU16. organizational guidelines, prevalent legislations and accessibility norms and processes to support PwDs at the workplace

KU17. strategies for time, effort and resource allocation towards the goals.

KU18. basic concepts of work productivity including waste reduction, efficient material usage and optimization of time

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. complete documentation and forms such as work orders, invoices maintenance records activity logs, attendance sheets as per organizational format in English and/or local language

GS2. write basic accident or incident report accurately in an appropriate format

GS3. read warnings, instructions and other text material on product labels, components, etc. and relevant signages, warnings, labels or descriptions on equipment, etc. while carrying out work activities

GS4. convey and share technical information clearly using appropriate language

GS5. clarify task-related information

GS6. liaise with authorities and supervisors as per organizational protocol

GS7. listen, speak, and write in an inclusive, respectful manner in line with organizational protocol

GS8. seek clarification from immediate supervisor or responsible authority or exercise most appropriate solutions to safety breaches at work

GS9. report to the supervisor and when to deal with a colleague depending on the type of concern

GS10. deliver product to next work process on time

GS11. improve work process and report potential areas of delays and disruptions

GS12. communicate problems appropriately to others

GS13. identify symptoms of the fault to the cause of the problem and resolve, otherwise seek assistance and support from other sources to solve the problem
GS14. anticipate and avoid hazards that may occur during repairs because of tools, materials used or repair processes
GS15. complete tasks efficiently and accurately within stipulated time
GS16. appreciate and respect social diversity in all professional settings
GS17. develop awareness and accountability for perspectives on gender, disabilities, and socio-cultural issues leading to discrimination, bias, or harassment at the workplace
GS18. maintain positive and effective relationships with colleagues and customers
Assessment Criteria

<table>
<thead>
<tr>
<th>Assessment Criteria for Outcomes</th>
<th>Theory Marks</th>
<th>Practical Marks</th>
<th>Project Marks</th>
<th>Viva Marks</th>
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<tbody>
<tr>
<td><em>Communicate effectively at the workplace</em></td>
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<tr>
<td>PC1. exchange information and instruction with colleagues, and seek clarifications and feedback as necessary</td>
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<tr>
<td>PC2. assist colleagues where required</td>
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<tr>
<td>PC3. follow business communication etiquette in all interactions and communicative formats (online, digital, and in-person)</td>
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<td>PC4. document and share all relevant information with stakeholders in agreed formats and as per agreed timelines</td>
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<tr>
<td><em>Work effectively</em></td>
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<tr>
<td>PC5. identify and obtain clarity regarding organisational, team and own goals and targets</td>
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<tr>
<td>PC6. prioritise and plan work in order to achieve goals and targets</td>
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<tr>
<td>PC7. monitor own and team performance as per agreed plan</td>
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<tr>
<td>PC8. complete duties accurately, systematically and within required timeframes</td>
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<td>PC9. express emotions appropriately at the workplace and manage own response to heightened emotions</td>
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<td>PC10. maintain orderliness and cleanliness in the work area</td>
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<tr>
<td><em>Maintain and enhance professional competence</em></td>
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<td>PC11. identify own strengths and weaknesses in relation to goals and targets</td>
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<tr>
<td>PC12. adapt self, service, or product to meet success criteria</td>
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<tr>
<td>Assessment Criteria for Outcomes</td>
<td>Theory Marks</td>
<td>Practical Marks</td>
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<tr>
<td><strong>PC13. seek and select opportunities for continuous professional development</strong></td>
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<td><strong>PC14. formulate a professional development plan to enhance capabilities</strong></td>
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<tr>
<td><strong>PC15. build or contribute to the organizational knowledge base of cases, clients, issues, solutions, and innovations</strong></td>
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<tr>
<td><strong>PC16. examine developments and trends in field of work and their potential impact on work</strong></td>
<td>1</td>
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<tr>
<td><strong>PC17. take feedback from peers, supervisors and clients to improve own performance and practices</strong></td>
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<td><strong>Work in a disciplined and ethical manner</strong></td>
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<td>16</td>
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<td><strong>PC18. perform tasks as per workplace standards, organisational policies and legislative requirements</strong></td>
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<td><strong>PC19. display appropriate professional appearance at the workplace and adhere to the organisational dress code</strong></td>
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<td><strong>PC20. demonstrate responsible and disciplined behaviour at the workplace such as punctuality; completing tasks as per given time and standards; demonstrating professional behaviour at all times, adopting environment-friendly practices, etc.</strong></td>
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<td><strong>PC21. identify the cause of conflict and options for resolution with peers or escalate grievances and problems to appropriate authority as per procedure for conflict resolution</strong></td>
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<td><strong>PC23. ensure services are delivered equally to all clients regardless of personal and cultural beliefs</strong></td>
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<td>Assessment Criteria for Outcomes</td>
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<td><strong>Uphold social diversity at the workplace</strong></td>
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<td>PC26. recognize and evaluate biased practices against underrepresented groups like women and</td>
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<td>persons with disabilities, in workplace systems and processes</td>
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<td>PC27. identify and report discrimination and harassment based on gender, disability, or cultural</td>
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<td>difference at the workplace</td>
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<td>PC28. use inclusive or neutral language and gestures in all interactions</td>
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ELE/N1002: Apply health and safety practices at the workplace

Description

This OS unit is about knowledge and practices relating to health, safety and security that candidates need to use in the workplace.

Scope

The scope covers the following:

- Deal with workplace hazards
- Apply fire safety practices
- Follow emergencies, rescue and first-aid procedures
- Effective waste management/recycling practices

Elements and Performance Criteria

Deal with workplace hazards

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

PC1. identify job-site hazards and possible causes of accident in the workplace
PC2. perform work complying to organizational safe working practices and observing hazard signs displayed on containers, equipment and in various work areas such as inside buildings, in open areas and public spaces, etc.
PC3. use appropriate personal protective equipment (PPE) for specific tasks and work conditions, contaminant (concentration w.r.t air) requirements and severity of hazard while conforming to the Indian/International standards
PC4. follow standard safety procedures while handling tool/ equipment, hazardous substances and while working in hazardous environments
PC5. dispose electronic waste (such as toxins; metals such as lead, cadmium, barium; flame retardant plastics, welding slag etc.) as per industry approved techniques
PC6. avoid damage of components due to negligence in electrostatic discharge (ESD) procedures
PC7. locate general health and safety equipment in the workplace such as fire extinguishers; first aid equipment; safety instruments, clothing and installations (fire exits, exhaust fans)
PC8. maintain appropriate posture while handling heavy objects
PC9. apply good housekeeping practices at all times

Apply fire safety practices

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

PC10. take preventive measures to prevent fire hazards
PC11. use appropriate fire extinguishers for different types of fires
   - Types of fires: Class A: e.g. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; Class C: e.g. electrical equipment such as appliances, wiring, breaker panels, etc. (These categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no l
PC12. exhibit rescue and first-aid techniques in case of fire or electrocution
Follow emergencies, rescue and first-aid procedures
To be competent, the user/individual on the job must be able to:

PC13. administer appropriate first aid to victims in case of bleeding, burns, choking, electric shock, poisoning etc.

PC14. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock,

PC15. participate regularly in emergency procedures such as raising alarm, safe/efficient, evacuation, correct means of taking shelter and escaping, correct assembly point, roll call, correct return to work

PC16. use correct method to move injured people and others during an emergency

Effective waste management/recycling practices
To be competent, the user/individual on the job must be able to:

PC17. identify recyclable and non-recyclable, and hazardous waste generated

PC18. segregate waste into different categories

PC19. ensure disposal of non-recyclable waste appropriately

PC20. deposit non-recyclable and reusable material at identified location

PC21. follow processes specified for disposal of hazardous waste

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. importance of working in clean and safe work environment following safety practices and procedures

KU2. health and safety roles and responsibilities of relevant personnel within and outside the organisation

KU3. key internal and external sources of health and safety information

KU4. basic knowledge of electronic devices and related health risks

KU5. meaning of hazards and risks

KU6. various types of health and safety hazards commonly present in the work environment such as physical hazards, electrical hazards, chemical hazards, fire hazards, equipment related hazards, health hazards, etc.

KU7. methods of accident prevention

KU8. importance of using protective clothing/equipment while working

KU9. general principles for identifying and controlling health and safety risks

KU10. main hazards and preventive as well as control measures while working with different types of equipment

KU11. importance of carrying out electrical and non-electrical isolation to prevent hazards from loss of machine/system/process control

KU12. main hazards and preventive as well as control measures when working with electrical systems or using electrical equipment

KU13. forms and classifications of hazardous substances

KU14. safe working practices while working at various hazardous sites

KU15. prevention and control measures to reduce risks from exposure to hazardous substances
KU16. health effects associated with exposure to noise and vibration and the appropriate control measures
KU17. precautionary activities to prevent the fire accident
KU18. various causes of fire such as heating of metal, spontaneous ignition, sparking, electrical eating, loose fires (smoking, welding, etc.) chemical fires etc.
KU19. techniques of using the different fire extinguishers
KU20. different methods and material to extinguish fires
KU21. different materials used for extinguishing fire such as sand, water, foam, CO2, dry powder
KU22. rescue techniques used during a fire hazard
KU23. various types of safety signs and their meaning
KU24. basic first aid treatment relevant to the common workplace injuries e.g. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries
KU25. contents of written accident report
KU26. potential injuries and ill health associated with incorrect handling of tools and equipment
KU27. safe lifting and carrying practices
KU28. potential impact to a person who is moved incorrectly
KU29. personal safety, health and dignity issues relating to the movement of a person by others
KU30. ESD measures and 5S
KU31. efficient utilization and management of material and water
KU32. ways to recognize common electrical problems and practices of conserving electricity
KU33. usage of different colours of dustbins, categorization of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics
KU34. organization's procedure for minimizing waste
KU35. waste management and methods of waste disposal
KU36. common sources of pollution and ways to minimize it
KU37. names, contact information and location of people responsible for health and safety in the workplace
KU38. location of documents and equipment for health and safety compliance/practices in the workplace
KU39. safety notices, signs and instructions at workplace

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. interpret general health and safety guidelines labels, charts, signages
GS2. read operation manuals
GS3. write health and safety compliance report
GS4. write an accident/incident report in local language or English
GS5. provide an emergency or safety incident brief to seniors or relevant authorities in a calm, clear and to-the-point manner
GS6. communicate general health and safety guidelines to colleagues/co-workers
GS7. communicate appropriately with co-workers in order to clarify instructions and other issues
GS8. act in case of any potential hazards observed in the work place
GS9. plan and organize their own work schedule, work area, tools, equipment in compliance with organizational policies for health, safety and security
GS10. take adequate measures to ensure the safety of clients and visitors at the workplace
GS11. identify immediate or temporary solutions to resolve delays
GS12. evaluate the work area for health and safety risks or hazards
GS13. use cause and effect relations to anticipate potential issues, problems and their solution in the work area related to safety
GS14. recognise emergency and potential emergency situations
GS15. protect self and others from a health and safety risk or hazard
GS16. communicate and collaborate to incorporate sustainable practices (greening) in workplace processes
GS17. record data on waste disposal at workplace
## Assessment Criteria

<table>
<thead>
<tr>
<th>Assessment Criteria for Outcomes</th>
<th>Theory Marks</th>
<th>Practical Marks</th>
<th>Project Marks</th>
<th>Viva Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deal with workplace hazards</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC1. identify job-site hazards and possible causes of accident in the workplace</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC2. perform work complying to organizational safe working practices and observing hazard signs displayed on containers, equipment and in various work areas such as inside buildings, in open areas and public spaces, etc.</td>
<td>3</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC3. use appropriate personal protective equipment (PPE) for specific tasks and work conditions, contaminant (concentration w.r.t air) requirements and severity of hazard while conforming to the Indian/International standards</td>
<td>3</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC4. follow standard safety procedures while handling tool/equipment, hazardous substances and while working in hazardous environments</td>
<td>3</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC5. dispose electronic waste (such as toxins; metals such as lead, cadmium, barium; flame retardant plastics, welding slag etc.) as per industry approved techniques</td>
<td>2</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC6. avoid damage of components due to negligence in electrostatic discharge (ESD) procedures</td>
<td>2</td>
<td>3</td>
<td>-</td>
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</tr>
<tr>
<td>PC7. locate general health and safety equipment in the workplace such as fire extinguishers; first aid equipment; safety instruments, clothing and installations (fire exits, exhaust fans)</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PC8. maintain appropriate posture while handling heavy objects</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC9. apply good housekeeping practices at all times</td>
<td>2</td>
<td>3</td>
<td>-</td>
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<tr>
<td><strong>Apply fire safety practices</strong></td>
<td></td>
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<tr>
<td>PC10. take preventive measures to prevent fire hazards</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Assessment Criteria for Outcomes</td>
<td>Theory Marks</td>
<td>Practical Marks</td>
<td>Project Marks</td>
<td>Viva Marks</td>
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<tr>
<td>------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>PC11.</td>
<td>1</td>
<td>3</td>
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</tr>
<tr>
<td>• use appropriate fire extinguishers for different types of fires</td>
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<tr>
<td>• Types of fires: Class A: e.g. ordinary solid combustibles, such as wood, paper, cloth, plastic,</td>
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<tr>
<td>charcoal, etc.; Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel,</td>
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<tr>
<td>tar, cooking oil, and similar substances; Class C: e.g. electrical equipment such as appliances,</td>
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<tr>
<td>wiring, breaker panels, etc. (These categories of fires become Class A, B, and D fires when</td>
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<tr>
<td>the electrical equipment that initiated the fire is no longer functioning)</td>
<td></td>
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</tr>
<tr>
<td>PC12. exhibit rescue and first-aid techniques in case of fire or electrocution</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Follow emergencies, rescue and first-aid procedures</td>
<td>6</td>
<td>13</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC13. administer appropriate first aid to victims in case of bleeding, burns, choking, electric</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>shock, poisoning etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC14. administer first aid to victims in case of a heart attack or cardiac arrest due to electric</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>shock, poisoning etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC15. participate regularly in emergency procedures such as raising alarm, safe/efficient,</td>
<td>2</td>
<td>4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>evacuation, correct means of taking shelter and escaping, correct assembly point, roll call,</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>correct return to work</td>
<td></td>
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</tr>
<tr>
<td>PC16. use correct method to move injured people and others during an emergency</td>
<td>2</td>
<td>4</td>
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</tr>
<tr>
<td>Effective waste management/recycling practices</td>
<td>5</td>
<td>12</td>
<td>-</td>
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<tr>
<td>PC17. identify recyclable and non-recyclable, and hazardous waste generated</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
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<tr>
<td>PC18. segregate waste into different categories</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC19. ensure disposal of non-recyclable waste appropriately</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PC20. deposit non-recyclable and reusable material at identified location</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Assessment Criteria for Outcomes</td>
<td>Theory Marks</td>
<td>Practical Marks</td>
<td>Project Marks</td>
<td>Viva Marks</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>--------------</td>
<td>-----------------</td>
<td>---------------</td>
<td>------------</td>
</tr>
<tr>
<td>PC21. follow processes specified for disposal of hazardous waste</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>NOS Total</td>
<td>35</td>
<td>65</td>
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</table>
National Occupational Standards (NOS) Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
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<tbody>
<tr>
<td>NOS Code</td>
<td>ELE/N1002</td>
</tr>
<tr>
<td>NOS Name</td>
<td>Apply health and safety practices at the workplace</td>
</tr>
<tr>
<td>Sector</td>
<td>Electronics</td>
</tr>
<tr>
<td>Sub-Sector</td>
<td>Generic</td>
</tr>
<tr>
<td>Occupation</td>
<td>Generic - Health Safety</td>
</tr>
<tr>
<td>NSQF Level</td>
<td>4</td>
</tr>
<tr>
<td>Credits</td>
<td>TBD</td>
</tr>
<tr>
<td>Version</td>
<td>3.0</td>
</tr>
<tr>
<td>Last Reviewed Date</td>
<td>24/02/2022</td>
</tr>
<tr>
<td>Next Review Date</td>
<td>24/02/2025</td>
</tr>
<tr>
<td>NSQC Clearance Date</td>
<td>24/02/2022</td>
</tr>
</tbody>
</table>

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.

2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.

3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.

4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).

5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criterion.

6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.

7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.
Minimum Aggregate Passing % at QP Level : 70

(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

<table>
<thead>
<tr>
<th>National Occupational Standards</th>
<th>Theory Marks</th>
<th>Practical Marks</th>
<th>Project Marks</th>
<th>Viva Marks</th>
<th>Total Marks</th>
<th>Weightage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELE/N3101.Engage with customer for service</td>
<td>40</td>
<td>50</td>
<td>-</td>
<td>10</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>ELE/N3112.Perform installation and repair of refrigerator</td>
<td>40</td>
<td>50</td>
<td>-</td>
<td>10</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>ELE/N3114.Perform installation and repair of air conditioners</td>
<td>40</td>
<td>50</td>
<td>-</td>
<td>10</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>ELE/N3116.Perform installation and repair of washing machine</td>
<td>40</td>
<td>50</td>
<td>-</td>
<td>10</td>
<td>100</td>
<td>20</td>
</tr>
<tr>
<td>ELE/N9905.Work effectively at the workplace</td>
<td>40</td>
<td>60</td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>ELE/N1002.Apply health and safety practices at the workplace</td>
<td>35</td>
<td>65</td>
<td>-</td>
<td>-</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>235</td>
<td>325</td>
<td>-</td>
<td>40</td>
<td>600</td>
<td>100</td>
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</table>
## Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOS</td>
<td>National Occupational Standard(s)</td>
</tr>
<tr>
<td>NSQF</td>
<td>National Skills Qualifications Framework</td>
</tr>
<tr>
<td>QP</td>
<td>Qualifications Pack</td>
</tr>
<tr>
<td>TVET</td>
<td>Technical and Vocational Education and Training</td>
</tr>
</tbody>
</table>
## Glossary

<table>
<thead>
<tr>
<th><strong>Sector</strong></th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub-sector</strong></td>
<td>Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td>Occupation is a set of job roles, which perform similar/related set of functions in an industry.</td>
</tr>
<tr>
<td><strong>Job role</strong></td>
<td>Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.</td>
</tr>
<tr>
<td><strong>Occupational Standards (OS)</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Performance Criteria (PC)</strong></td>
<td>Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.</td>
</tr>
<tr>
<td><strong>National Occupational Standards (NOS)</strong></td>
<td>NOS are occupational standards which apply uniquely in the Indian context.</td>
</tr>
<tr>
<td><strong>Qualifications Pack (QP)</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Unit Code</strong></td>
<td>Unit code is a unique identifier for an Occupational Standard, which is denoted by an ‘N’</td>
</tr>
<tr>
<td><strong>Unit Title</strong></td>
<td>Unit title gives a clear overall statement about what the incumbent should be able to do.</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td>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.</td>
</tr>
<tr>
<td>Knowledge and Understanding (KU)</td>
<td>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.</td>
</tr>
<tr>
<td>----------------------------------</td>
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</tr>
<tr>
<td>Organisational Context</td>
<td>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.</td>
</tr>
<tr>
<td>Technical Knowledge</td>
<td>Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.</td>
</tr>
<tr>
<td>Core Skills/ Generic Skills (GS)</td>
<td>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.</td>
</tr>
<tr>
<td>Electives</td>
<td>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.</td>
</tr>
<tr>
<td>Options</td>
<td>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.</td>
</tr>
</tbody>
</table>