

## QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR ELECTRONICS INDUSTRY

### What are Occupational Standards(OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

#### Contact Us:

ESSCI, New Delhi  
Electronics Sector Skills  
Council of India  
422, Okhla Industrial  
Estate, Phase-III,  
New Delhi-110020  
E-mail:  
info@essci-india.org



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### Introduction

## Qualifications Pack-Field Technician (Computing and Peripherals)

**SECTOR:** ELECTRONICS

**SUB-SECTOR:** IT Hardware

**OCCUPATION:** After Sales Support

**REFERENCE ID:** ELE/Q4601

**Field Technician:** Also called ‘Service Technician’, the Field Technician provides after sale support services to customers, typically, at their premises.

**Brief Job Description:** The individual at work is responsible for attending to customer complaints, installing newly purchased products, troubleshooting system problems and, configuring peripherals such as printers, scanners and network devices.

**Personal Attributes:** The job requires the individual to have: ability to build interpersonal relationships and critical thinking. The individual must be willing to travel to client premises in order to attend to calls at different locations.



**G&J/ N 0111**



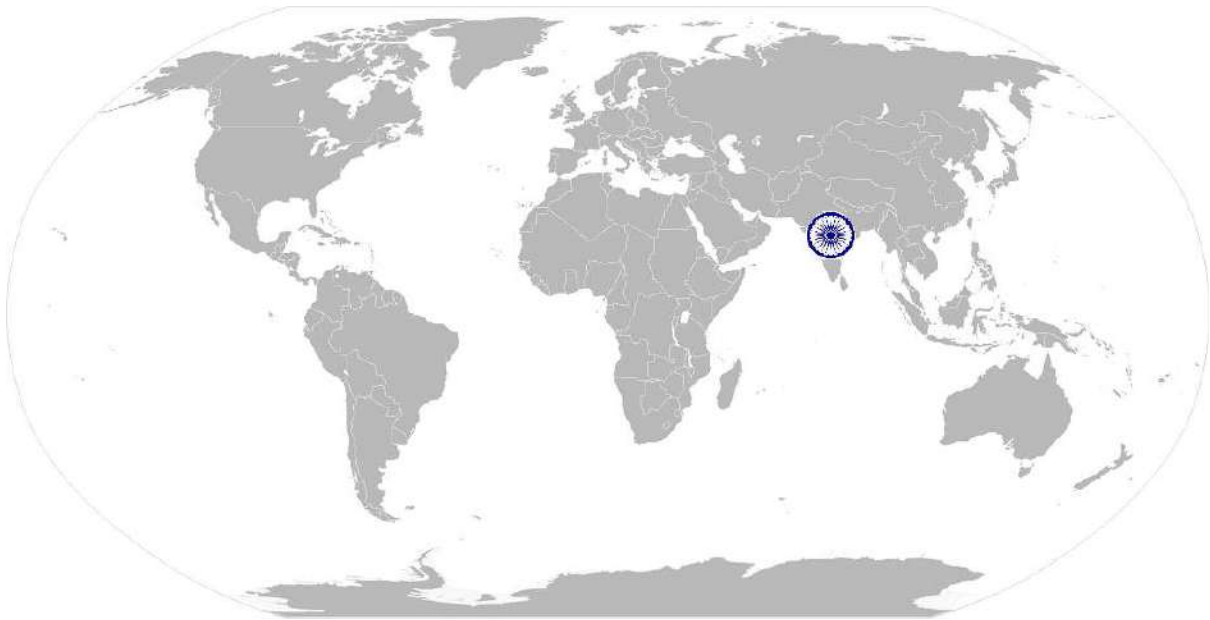
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<b>Job Details</b>	<b>Qualifications Pack Code</b>	<b>ELE/Q4601</b>		
	<b>Job Role</b>	<b>Field Technician – Computing and Peripherals</b>		
	<b>Credits(NVEQF/NVQF/NSQF) [OPTIONAL]</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
	<b>Sector</b>	<b>Electronics</b>	<b>Drafted on</b>	<b>17/11/13</b>
	<b>Sub-sector</b>	<b>IT Hardware</b>	<b>Last reviewed on</b>	<b>24/12/13</b>
	<b>Occupation</b>	<b>After Sales Support</b>	<b>Next review date</b>	<b>23/12/14</b>

<b>Job Role</b>	<b>Field Technician – Computing and Peripherals Also called 'Service Technician'</b>
<b>Role Description</b>	Installing the system and configuring the peripherals, and attending to field calls from customer and complaints for system trouble shooting and repairs
<b>NVEQF/NVQF level</b>	4
<b>Minimum Educational Qualifications</b>	12th Standard Passed
<b>Maximum Educational Qualifications</b>	ITI, Diploma, BSc Computer Science, B.E. (Electrical, Electronics & Communications, Computer Science, IT and related)
<b>Training</b>	Not Applicable
<b>Experience</b>	1 year in computer hardware maintenance for 12 <sup>th</sup> passed
<b>Applicable National Occupational Standards (NOS)</b>	<p><b>Compulsory:</b></p> <ol style="list-style-type: none"> <li><a href="#">ELE/N4601 Engage with customer</a></li> <li><a href="#">ELE/N4602 Install, configure and setup the system</a></li> <li><a href="#">ELE/N4603 Troubleshoot and replace faulty module</a></li> <li><a href="#">ELE/N9909 Coordinate with colleagues and co-workers</a></li> </ol> <p><b>Optional:</b> Not applicable</p>
<b>Performance Criteria</b>	As described in the relevant OS units

# National Occupational Standard



## Overview

This unit is about technician interacting with and understanding the customers' repair requirements.

**ELE/N4601**

**Engage with customers**

National Occupational Standard

Unit Code	ELE/N4601
Unit Title (Task)	Engage with customers
Description	This OS unit is about interacting with and understanding the customers' requirements
Scope	<p>This unit/ task covers the following:</p> <ul style="list-style-type: none"> <li>Interact with the customer prior to visit</li> <li>Understand customer's requirements on visit or prior to visit</li> <li>Suggest possible solutions</li> <li>Complete the documentation</li> <li>Achieve productivity and quality as per company's norms</li> </ul>
Performance Criteria(PC) w.r.t. the Scope	
Element	Performance Criteria
<b>Interacting with customer</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC1. call the customer based on inputs logged into customer care</p> <p>PC2. greet the customer and listen to their problem attentively</p> <p>PC3. check with customer about time for visit, field work and confirm location</p> <p>PC4. follow etiquette when interacting with customers as per company policy such as politeness and patience</p> <p>PC5. seek feedback from the customers on completion of work</p>
<b>Understanding customer's requirements</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC6. understand location requirement for placement of system during and after installation</p> <p>PC7. seek inputs to understand symptoms for the problem faced</p> <p>PC8. ask open and close-ended questions to understand the specific problem</p> <p>PC9. inform customer about the replacement or repair process</p> <p>PC10. enquire about warranty coverage</p> <p>PC11. educate about other useful products and annual maintenance contract</p>
<b>Suggesting solutions</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC12. summarise the problem to customer and suggest the possible solutions</p> <p>PC13. inform customers on whether the module has to be replaced or repaired with reasons</p> <p>PC14. explain the customers on time taken, repair process and possible cost for the service or inclusion under warranty</p> <p>PC15. seek customer's approval for further service</p>
<b>Completing documentation</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC16. provide note to customers about the problem(s), actions taken and the cost associated and retain a copy</p>

**ELE/N4601**

**Engage with customers**

	PC17. provide appropriate invoice for any purchase of module or parts by customer
<b>Achieving productivity and quality</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC18. interact with customer on time within the specified Service Level Agreement (SLA) time</p> <p>PC19. identify the customer's requirement and identify the resources and record</p> <p>PC20. accurately assess the problem and suggest appropriate solutions</p> <p>PC21. offer the right service as per customer's requirements</p> <p>PC22. communicate problem effectively in order to secure customer's confidence</p> <p>PC23. gauge customer satisfaction with the installation and placement of device</p> <p>PC24. maintain no repeat or second escalation from customer</p> <p>PC25. achieve customer satisfaction on engagement behaviour such as listening to complaints or appropriate dressing</p> <p>PC26. achieve 100% customer satisfaction and positive feedback</p>
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)	<p>The individual on the job needs understand:</p> <p>KA1. company's policies on: customer care</p> <p>KA2. company's code of conduct</p> <p>KA3. organisation culture and typical customer profile</p> <p>KA4. company's reporting structure</p> <p>KA5. company's documentation policy</p>
<b>B. Technical Knowledge</b>	<p>The individual on the job needs to know and understand:</p> <p>KB1. company's products and recurring problems reported</p> <p>KB2. how to communicate with customers in order to put them at ease</p> <p>KB3. basic electronics of system hardware</p> <p>KB4. hardware maintenance</p> <p>KB5. functions of electrical and mechanical parts/ modules</p> <p>KB6. behavioural aspects and etiquette to be followed at customer's premises</p> <p>KB7. precautions to be taken while handling field calls and dealing with customers</p> <p>KB8. Relevant reference sheets, manuals and documents to carry in the field</p>
<b>Skills (S)</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Reading and writing skills</b>
	<p>The individual on the job needs to know and understand:</p> <p>SA1. how to read product and module serial numbers and interpret details such as make, date, availability</p> <p>SA2. how to note problems on job sheet and details of work done</p>
<b>B. Professional Skills</b>	<b>Interpersonal skills</b>
	<p>The individual on the job needs to know and understand:</p> <p>SB1. how to develop a rapport with customers</p> <p>SB2. how to listen carefully and interpret their requirement</p> <p>SB3. how to suggest customer on possible solutions</p>

**ELE/N4601**

**Engage with customers**

	<b>Communication skills</b>
	The individual on the job needs to know and understand:
	SB4. how to seek inputs at assess the problems
	SB5. how to put the customer at ease and suggest solutions
	SB6. how to communicate in local language
SB7. how to educate and inform customer about contractual issues such as warranty, cost of service and module replacement	
SB8. how to educate on precautions to be taken post repairs to avoid recurrence of problem	
<b>Behavioural skills</b>	
The individual on the job needs to know and understand:	
SB9. importance of personal grooming	
SB10. significance of etiquette such as maintaining the appropriate physical distance with customer during conversation, not entering bedroom without permission	
SB11. importance of being patient and courteous with all types of customers	
SB12. being polite and courteous under all circumstances	
<b>Decision making skills</b>	
SB13. decide on the spot on whether interaction of customer with supervisor is necessary or not	
SB14. when to call customer care and close the call after work is done to customer's satisfaction and documentation is complete	

**ELE/N4601**

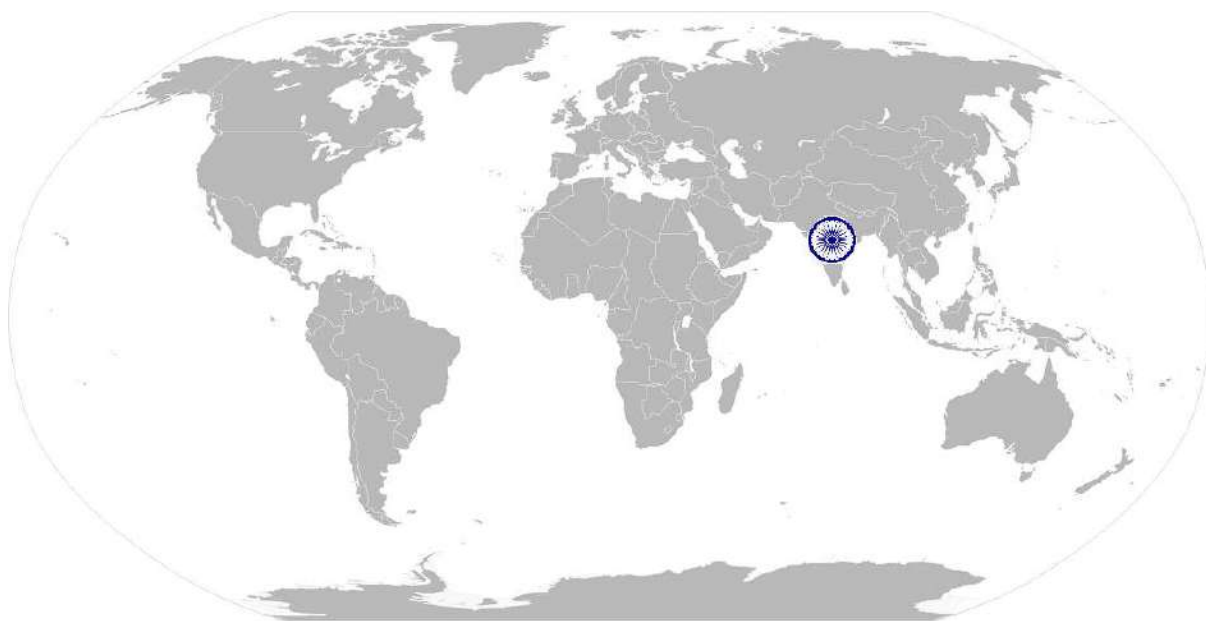
**Engage with customers**

<b>NOS Code</b>	<b>ELE/N4601</b>		
<b>Credits(NVEQF/NVQF/NSQF) [OPTIONAL]</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Electronics</b>	<b>Drafted on</b>	<b>17/11/13</b>
<b>Industry Sub-sector</b>	<b>IT Hardware</b>	<b>Last reviewed on</b>	<b>24/12/13</b>
		<b>Next review date</b>	<b>23/12/14</b>

**NOS Version Control**



# National Occupational Standard



## Overview

This unit is about installing the system and configuring peripherals such as the printers, scanners, and network devices.

**ELE/N4602**

**Install, configure and setup hardware system**

<b>National Occupational Standard</b>	<b>Unit Code</b>	<b>ELE /N4602</b>
	<b>Unit Title (Task)</b>	<b>Install, configure and setup hardware system</b>
	<b>Description</b>	This OS unit is about installing the system, configuring the and setting up to make it ready to work on
	<b>Scope</b>	<p>This unit/ task covers the following:</p> <ul style="list-style-type: none"> <li>• Understand the installation requirement and install the hardware</li> <li>• Configure and install the peripherals</li> <li>• Check system functionality</li> <li>• Set up the software</li> <li>• Complete the installation task and report</li> <li>• Interact with customer</li> <li>• Interact with superior</li> <li>• Achieve productivity and quality as per company's norms</li> </ul>
	<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>	
<b>Installing hardware</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC1. check site conditions</p> <p>PC2. check and ensure any tailor-made programs required by the customer</p> <p>PC3. open the packaging of new product and take out the hardware carefully</p> <p>PC4. connect all the hardware devices such as CPU, Monitor, Keyboard, Mouse, as per the specifications of the system</p> <p>PC5. in case of laptop, connect battery, plug in and switch on the system</p> <p>PC6. follow standard operating procedure while handling hardware modules such as handling PCB with ESD standards</p> <p>PC7. follow the standard operating procedure for installation of each model of hardware devices and comply with them</p> <p>PC8. place the system at a location as preferred by customer</p> <p>PC9. install the hardware / devices as per standard operating procedure</p> <p>PC10. ensure that appropriate device and model specific procedure is followed as per installation manual</p> <p>PC11. maintain zero-material defect during material handling by following standard operating procedure</p> <p>PC12. carry tools and manuals as per installation manual</p>	
<b>Configuring and setting up peripherals</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC13. understand the peripheral requirements of customers and ensure all hardware are available</p>	

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**Install, configure and setup hardware system**

	<p>PC14. understand the placement requirement of peripheral equipment such as printers, modems, etc., as per customer preferences</p> <p>PC15. connect the peripheral devices with the system as per the standard procedure followed for each equipment</p> <p>PC16. install the peripherals, connect the appropriate peripheral such as printer, scanner to the system and run the installed program for set up</p> <p>PC17. follow the safety procedures while handling and installing the equipment</p> <p>PC18. install and configure peripherals as standard operating procedure</p> <p>PC19. ensure the placement of peripherals are as per customer requirement</p>
<b>Setting up Software</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC20. install the operating system and appropriate application software as per customer preference</p> <p>PC21. install additional software as per standard customer requirement</p> <p>PC22.</p>
<b>Checking system functionality</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC23. switch on the system and peripherals and check for effective functioning</p> <p>PC24. check and ensure the functionality of system, peripherals and applications</p> <p>PC25. ensure product functions are tested and demo given to the customer after hardware, software, operating system and peripheral integration with reference to the installation manual</p> <p>PC26. ensure that customer is satisfied</p>
<b>Completing installation</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC27. measure and meet multipart calls norm against benchmark</p> <p>PC28. complete the installation within the agreed Turn Around Time (TAT)</p> <p>PC29. complete the call closure in single visit</p> <p>PC30. complete the task with the quality benchmark of the company</p>
<b>Interacting with customer</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC31. understand the customer requirement and queries on the hardware</p> <p>PC32. educate customer on use of and procedures to be followed in operation of hardware</p> <p>PC33. inform customer about warranty and other terms and conditions on the hardware devices</p> <p>PC34. inform about cost estimates for any other new installations</p> <p>PC35. provide adequate information about the hardware devices, operating procedure, maintenance, etc., to the customer</p> <p>PC36. address the queries and issues raised by the customer on device</p> <p>PC37. inform customers clearly about warranty, and product terms and conditions</p> <p>PC38. provide customers on all the appropriate documents including invoice</p>
<b>Interacting with superior</b>	<p>PC39. understand the work requirement from superior, periodically</p> <p>PC40. report to superior on the work completed</p> <p>PC41. escalate the customer issues and problems that cannot be handled at field level</p> <p>PC42. document the work completed on the company ERP software for tracking and future references</p>

**ELE/N4602**

**Install, configure and setup hardware system**

<p><b>Achieving productivity and quality</b></p>	<p>To be competent, the user/ individual must be able to:</p> <p>PC43. achieve 100% on-time completion of field installation with reference to agreed target and time</p> <p>PC44. submit feedback form on customer satisfaction level with respect to the product installation</p> <p>PC45. find solutions to customer complaints and queries unresolved in the field</p> <p>PC46. report work status and prepare documentation as per company standards</p>
<p><b>Knowledge and Understanding (K)</b></p>	
<p><b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)</p>	<p>The individual on the job needs to know and understand:</p> <p>KA1. company's policies on: incentives, delivery standards, and personnel management</p> <p>KA2. company's sales and after sales support policy</p> <p>KA3. importance of the individual's role in the workflow</p> <p>KA4. reporting structure</p> <p>KA5. company's policy on product's warranty and other terms and conditions</p> <p>KA6. company's line of business and product portfolio</p>
<p><b>B. Technical Knowledge</b></p>	<p>The individual on the job needs to know and understand:</p> <p>KB1. basic electronics involved in the hardware</p> <p>KB2. different types of IT hardware products and functionalities</p> <p>KB3. functions of electrical and mechanical parts/ modules</p> <p>KB4. typical customer profile</p> <p>KB5. company's portfolio of products and that of competitors</p> <p>KB6. installation procedures given in the manuals</p> <p>KB7. different types of equipment assembled in a pack (one system)</p> <p>KB8. different types of peripherals and their standard installation procedure</p> <p>KB9. specification and the procedures to be followed for setting up the system</p> <p>KB10. voltage and power requirement for different hardware devices</p> <p>KB11. memory, input, output and storage devices</p> <p>KB12. different modules in system such as SMPS, drivers, hard disk, battery, mother board</p> <p>KB13. different module in the peripheral and their functions</p>

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**Install, configure and setup hardware system**

	<p>KB14. how to operate the system and other hardware peripherals</p> <p>KB15. controls of different peripherals including UPS</p> <p>KB16. implementation process for Engineering Change Order (ECO)</p> <p>KB17. all safety rules, policies and procedures</p> <p>KB18. quality standards to be followed</p>
<b>Skills (S) [Optional]</b>	
<p><b>A. Core Skills/ Generic Skills</b></p>	<p><b>Reading and writing skills</b></p>
	<p>The user/individual on the job needs to know and understand how:</p> <p>SA1. to read job sheet and/or complaints received by customer care</p> <p>SA2. to document the completed work</p> <p>SA3. to note customer complaints solution provided</p> <p>SA4. to read the standard operating procedures for different equipment</p>
<p><b>B. Professional Skills</b></p>	<p><b>Teamwork and multitasking</b></p>
	<p>The user/individual on the job needs to know and understand how:</p> <p>SA5. to share work load as required</p> <p>SA6. to achieve the targets given on service and sales</p>
	<p><b>Hardware and Software operation skills</b></p>
	<p>The user/individual on the job needs to know and understand how to:</p> <p>SB1. operate computer and laptop</p> <p>SB2. operate the peripheral hardware</p> <p>SB3. operate the different software</p> <p>SB4. configure different settings and installations of hardware and software as per customer requirement</p>
	<p><b>Computer system and peripheral hardware related skills</b></p>
	<p>The user/individual on the job needs to know and understand how:</p> <p>SB5. to assemble and set up computer and laptop</p> <p>SB6. to assemble and install the peripheral hardware</p> <p>SB7. different hardware modules in the computer system and peripherals</p> <p>SB8. to identify basic electronic components and know their functions</p>
	<p><b>Using tools and machines</b></p>
	<p>The user/individual on the job needs to know and understand how:</p>

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**Install, configure and setup hardware system**

	SB9. to operate electronic screw drivers for installation of equipment
	SB10. to use other specific devices for installation of peripherals
	<b>Reflective thinking</b>
	The user/individual on the job needs to know and understand how: SB11. to improve work processes SB12. to reduce repetition of errors
	<b>Critical thinking</b>
	The user/individual on the job needs to know and understand how: SB13. to spot process disruptions and delays SB14. to report on any customer concerns to superiors without delay

**NOS Version Control**

**ELE/N4602**

**Install, configure and setup hardware system**

<b>NOS Code</b>	<b>ELE/N4602</b>		
<b>Credits(NVEQF/NVQF/NSQF) [OPTIONAL]</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
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		<b>Next review date</b>	<b>23/12/14</b>

# National Occupational Standard



## Overview

This unit is about troubleshooting hardware related problems by diagnosing and replacing faulty module at customer's premises.



**ELE/N4603**

**Troubleshoot and replace faulty module**

National Occupational Standard

<b>Unit Code</b>	<b>ELE /N4603</b>
<b>Unit Title (Task)</b>	<b>Troubleshoot and replace faulty module</b>
<b>Description</b>	This OS unit is about diagnosing the problem and troubleshooting problems in the hardware
<b>Scope</b>	<p>This unit/ task covers the following:</p> <ul style="list-style-type: none"> <li>• Receive and understand the customer complaint registered at customer care</li> <li>• Identify system problems on field visit</li> <li>• Replace faulty module after diagnosis</li> <li>• Interact with customer</li> <li>• Report to Superior</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Understanding customer complaint</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC1. listen carefully to concerns registered by customer at customer care</p> <p>PC2. interact with customer on telephone for better understanding of concern before the visit</p> <p>PC3. commence field trip based on type of complaint</p> <p>PC4. carry the troubleshooting instructions sheets</p> <p>PC5. understand the warranty, terms and conditions with relation to the product</p> <p>PC6. identify the type of problem and carry relevant tools and equipment based customer complaint and standard operating procedure</p> <p>PC7. assess whether replacement or repair of module may be required</p> <p>PC8. carry only 100% approved and verified field replaceable parts for repairing or replacing</p> <p>PC9. decide on whether it can be repaired in field or at company's test centre</p>
<b>Identifying system-level problem on field</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC10. understand the problems experienced by the customer</p> <p>PC11. use equipment such as 'power on self test' (POST) card to identify the common errors and issues in the system which does not start up</p> <p>PC12. conduct root-cause analysis and identify the likely problem area</p> <p>PC13. disassemble and check each part of computing system such as SMPS, Memory, Hard disk to isolate the failed module</p> <p>PC14. follow standard operating procedure while handling hardware modules such as handling PCB with ESD standards</p> <p>PC15. in case of peripherals, check all parts such as print head, lens, led display to isolate faulty module</p> <p>PC16. make decision on whether the part can be replaced or component should be repaired</p> <p>PC17. identify the solution design where the module to be replaced or software to be installed or updated</p>

**ELE/N4603**

**Troubleshoot and replace faulty module**

	PC18. decide on whether to replace module or send to repair centre
<b>Replacing faulty module</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC19. if the module has to be replaced, disassemble the system, remove and replace and re-assemble the system</p> <p>PC20. if soldering needs to be done, use manual hand soldering iron unit to solder the components or parts</p> <p>PC21. if there is any operating system error, software related issues, reinstal the software or fixing the issues</p> <p>PC22. fix the common problems faced with peripherals and networking devices</p> <p>PC23. escalate the problems which cannot be addressed at field level to the superior for servicing at company's repair stations</p> <p>PC24. coordinate with remote technical helpdesk to seek any assistance on field</p> <p>PC25. follow appropriate safety procedures while handling tools such as soldering iron</p> <p>PC26. test 100% products or functions are tested after new hardware modules or software is installed</p>
<b>Completing repairs</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC27. understand clearly the requirement before field visit</p> <p>PC28. report percentage of call closure in multiple visits against benchmark</p> <p>PC29. ensure no sub-standard or unverified parts are used in replacing</p> <p>PC30. complete the function within the agreed Turn Around Time (TAT)</p> <p>PC31. complete the call closure in single visit</p> <p>PC32. complete the task with the quality benchmark of the company</p> <p>PC33. meet monthly or daily target given</p>
<b>Interacting with customer</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC34. inform customer about the problem, action to be taken</p> <p>PC35. inform customer on adequate information about hardware device or software</p> <p>PC36. instruct customer on use of and procedures to be followed for operating the system or hardware</p> <p>PC37. confirm acceptance before replacing module or sending for repairs to company</p> <p>PC38. inform customer about warranty and other terms and conditions on the replaced or repaired hardware devices</p> <p>PC39. provide relevant documents to customers on completion of work</p> <p>PC40. achieve 100% satisfaction with customer on post sales service</p>
<b>Reporting to superior</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC41. receive the work order from the superior or customer care about the complaint registered</p> <p>PC42. report on the work load and completion status</p> <p>PC43. find solutions to customer complaints and queries that are unresolved in the field</p> <p>PC44. escalate the problems that cannot be resolved at field level with reason</p> <p>PC45. report 100% on time completion of field repair or hardware replacement with reference to agreed target and time or reasons for not meeting target</p> <p>PC46. submit the feedback form on customer satisfaction level with respect to the product repair</p>

**ELE/N4603**

**Troubleshoot and replace faulty module**

	<p>PC47. accurately report work status through proper documentation as per company's standards</p> <p>PC48. create knowledge bank on the complex repairs made through documentation</p>
<b>Knowledge and Understanding (K)</b>	
<p><b>A. Organizational Context</b> (Knowledge of the company / organization and its processes)</p>	<p>The individual on the job needs to know and understand:</p> <p>KA1. company's policies on: incentives, delivery standards, and personnel management</p> <p>KA2. company's sales and after sales support policy</p> <p>KA3. importance of the individual's role in the workflow</p> <p>KA4. reporting structure</p> <p>KA5. company's policy on product's warranty and other terms and conditions</p> <p>KA6. company's line of business and product portfolio</p>
<p><b>B. Technical Knowledge</b></p>	<p>The individual on the job needs to know and understand:</p> <p>KB1. company's portfolio of products</p> <p>KB2. different types of IT hardware products and functionalities</p> <p>KB3. different electrical and mechanical modules in the product</p> <p>KB4. basic electronics of the hardware</p> <p>KB5. different models of devices and their repair procedures</p> <p>KB6. different equipments assembled in a pack (one system)</p> <p>KB7. peripherals and their standard operating procedure for disassembling and re-assembling</p> <p>KB8. procedures to be followed for trouble shooting and standards to follow</p> <p>KB9. voltage and power requirement for different hardware devices</p> <p>KB10. memory, input, output and storage devices</p> <p>KB11. different modules in system such as SMPS, drivers, hard disk, battery, mother board</p> <p>KB12. tools required for repair such as soldering iron, multimeter</p> <p>KB13. controls of different peripherals</p> <p>KB14. all safety procedures to follow</p> <p>KB15. quality standards to be followed</p> <p>KB16. Electrostatic Discharge (ESD) and measures to be taken</p>
<b>Skills (S) [Optional]</b>	
<p><b>A. Core Skills/ Generic Skills</b></p>	<p><b>Reading and writing skills</b></p>
	<p>The user/individual on the job needs to know and understand how:</p> <p>SA1. to read job sheet and/or complaints registered at customer care</p> <p>SA2. to document the completed work</p> <p>SA3. to note customer complaints and solution provided</p> <p>SA4. to read the standard operating procedure manual for different equipment</p>
	<p><b>Teamwork and multitasking</b></p>
	<p>The user/individual on the job needs to know and understand how:</p> <p>SA5. to share work load as required</p>

**ELE/N4603**

**Troubleshoot and replace faulty module**

	SA6. to achieve the target
<b>B. Professional Skills</b>	<b>Hardware operating skills</b>
	The user/individual on the job needs to know and understand how to:
	SB1. operate computer and laptop
	SB2. operate the peripheral hardware equipment
	SB3. operate the different software
	SB4. configure different settings and installations of hardware and software as per customer requirement
	<b>Computer system and peripheral hardware related skills</b>
	The user/individual on the job needs to know and understand how:
	SB5. different modules and their functions in computer systems
	SB6. to diagnose the issues in computer and laptop hardware modules
SB7. to diagnose the issues in peripheral modules	
SB8. assemble modules in computer system and peripherals	
<b>Using tools and machines</b>	
The user/individual on the job needs to know and understand how to:	
SB9. operate electronic screw drivers for disassembling and assembling of equipments	
SB10. use other specific devices for repairs such as soldering iron, multimeter, POST cards	
<b>Reflective thinking</b>	
The user/individual on the job needs to know and understand how to:	
SB11. improve work processes	
SB12. reduce errors on field and repeat trips	
<b>Critical thinking</b>	
The user/individual on the job needs to know and understand how to:	
SB13. spot process disruptions and delays	
SB14. report on any issues raised by customers to superiors without delay	

**ELE/N4603**

**Troubleshoot and replace faulty module**

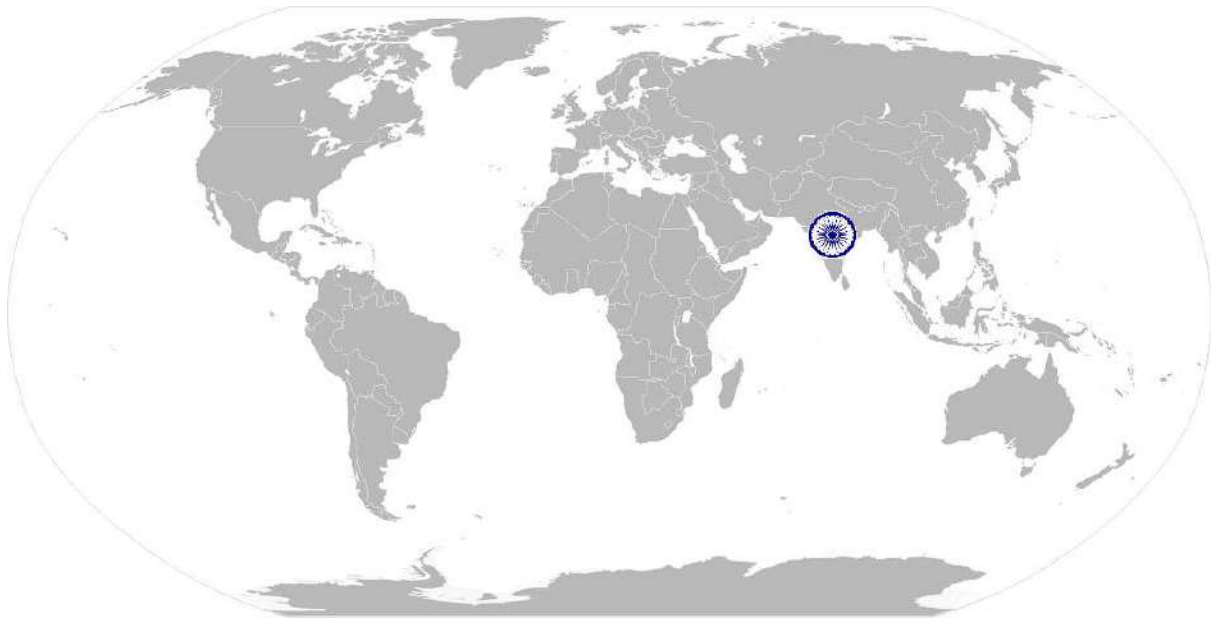
## **NOS Version Control**

<b>NOS Code</b>	<b>ELE/N4603</b>		
<b>Credits(NVEQF/NVQF/NSQF) [OPTIONAL]</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Electronics</b>	<b>Drafted on</b>	<b>17/11/13</b>
<b>Industry Sub-sector</b>	<b>IT Hardware</b>	<b>Last reviewed on</b>	<b>24/12/13</b>
		<b>Next review date</b>	<b>23/12/14</b>

**ELE/N4603**

**Troubleshoot and replace faulty module**

# National Occupational Standard



## Overview

This unit is about the individual's level of communication with colleagues and other departments within the organisation. It determines the ability to work as a team member to achieve the required deliverables on schedule.

**ELE/N9909**

**Coordinate with colleagues and co-workers**

National Occupational Standard

<b>Unit Code</b>	<b>ELE/N9909</b>
<b>Unit Title (Task)</b>	<b>Coordinate with colleagues</b>
<b>Description</b>	This OS unit is about communicating with colleagues and seniors in order to achieve smooth work flow
<b>Scope</b>	<p>This unit/ task covers the following:</p> <ul style="list-style-type: none"> <li>• Interact with supervisor or superior</li> <li>• Coordinate with colleagues</li> </ul>
<b>Performance Criteria(PC) w.r.t. the Scope</b>	
<b>Element</b>	<b>Performance Criteria</b>
<b>Interacting with supervisor</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC1. understand and assess work requirements</p> <p>PC2. understand the targets and incentives</p> <p>PC3. understand new operating procedures and constraints</p> <p>PC4. report problems in the field</p> <p>PC5. resolve personnel issues</p> <p>PC6. receive feedback on work standards and customer satisfaction</p> <p>PC7. communicate any potential hazards at a particular location</p> <p>PC8. meet given targets</p> <p>PC9. deliver work of expected quality despite constraints</p> <p>PC10. receive positive feedback on behaviour and attitude shown during interaction</p>
<b>Coordinating with colleagues</b>	<p>To be competent, the user/ individual must be able to:</p> <p>PC11. interact with colleagues from different functions and understand the nature of their work</p> <p>PC12. receive spares from tool room or stores; deposit faulty modules and tools to stores</p> <p>PC13. pass on customer complaints to colleagues in a respective geographical area</p> <p>PC14. assist colleagues with resolving field problems resolve conflicts and achieve smooth workflow</p> <p>PC15. follow the company policy during cross functional interaction</p>
<b>Knowledge and Understanding (K)</b>	
<b>A. Organizational Context</b> (Knowledge of the	<p>The individual on the job needs to know and understand:</p> <p>KA1. company's policies on: incentives, delivery standards, and personnel management</p>



**ELE/N9909**

**Coordinate with colleagues and co-workers**

company / organization and its processes)	<p>KA2. importance of the individual's role in the workflow</p> <p>KA3. reporting structure</p>
<b>B. Technical Knowledge</b>	<p>The individual on the job needs to know and understand:</p> <p>KB1. how to communicate effectively</p> <p>KB2. how to build team coordination</p>
<b>Skills (S) [Optional]</b>	
<b>A. Core Skills/ Generic Skills</b>	<b>Teamwork and multitasking</b>
	<p>The individual on the job needs to know and understand how:</p> <p>SA1. to deliver product to next work process on time</p>
<b>B. Professional Skills</b>	<b>Decision making</b>
	<p>The individual on the job needs to know and understand:</p> <p>SB1. how to report potential areas of disruptions to work process</p> <p>SB2. when to report to supervisor and when to deal with a colleague depending on the type of concern</p>
	<b>Reflective thinking</b>
	<p>The individual on the job needs to know and understand:</p> <p>SB3. how to improve work process</p>
	<b>Critical thinking</b>
	<p>The individual on the job needs to know and understand:</p> <p>SB4. how to spot process disruptions and delays</p>

**Coordinate with colleagues and co-workers**

**NOS Version Control**

<b>NOS Code</b>	<b>ELE/N9909</b>		
<b>Credits(NVEQF/NVQF/NSQF) [OPTIONAL]</b>	<b>TBD</b>	<b>Version number</b>	<b>1.0</b>
<b>Industry</b>	<b>Electronics</b>	<b>Drafted on</b>	<b>17/11/13</b>
<b>Industry Sub-sector</b>	<b>IT Hardware</b>	<b>Last reviewed on</b>	<b>24/12/13</b>
		<b>Next review date</b>	<b>23/12/14</b>

Definitions

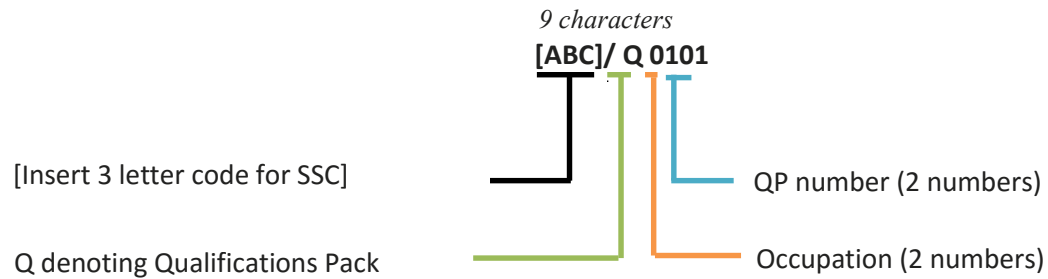
Keywords /Terms	Description
Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further 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.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or an area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of OS.
Sub-function	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
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 they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria	Performance criteria are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (OS)	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.
Knowledge and Understanding	Knowledge and understanding 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	Core skills or generic skills 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.
Keywords /Terms	Description
NOS	National Occupational Standard(s)
NVQF	National Vocational Qualifications Framework
NSQF	National Qualifications Framework
NVEQF	National Vocational Education Qualifications Framework
QP	Qualifications Pack

## Annexure

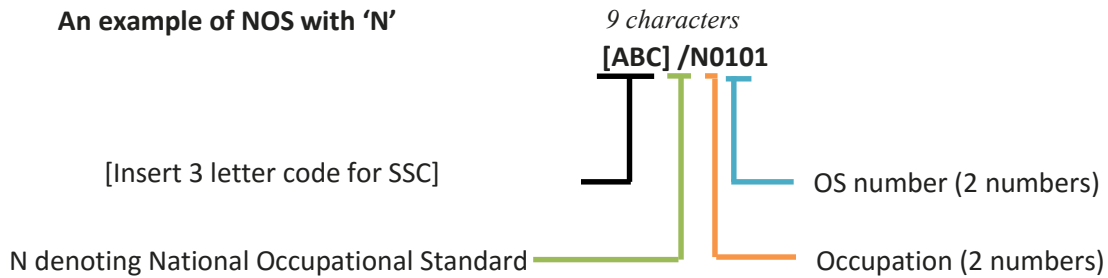
### Nomenclature for QP and NOS

#### Qualifications Pack



#### Occupational Standard

##### An example of NOS with 'N'



The following acronyms/codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Passive Components	01 - 10
Semiconductors	11 - 20
PCB Manufacturing	21 - 30
Consumer Electronics	31 - 40
IT Hardware	41 - 50
PCB Assembly	51 - 55
Solar Electronics	56 - 60
Strategic Electronics	61 - 65
Automotive Electronics	66 - 70
Industrial Electronics	71 - 75
Medical Electronics	76 - 80
Communication Electronics	81 - 85
PCB Design	86 - 90
LED	91 - 95

Sequence	Description	Example
Three letters	Industry name	ELE
Slash	/	/
Next letter	Whether QP or NOS	Q
Next two numbers	Occupation code	01
Next two numbers	OS number	01

## CRITERIA FOR ASSESSMENT

Element	Performance Criteria	Total Marks (400)	Out Of	Theory	Skills Practical
<b>ELE/N4601 Engage with customers</b>					
<b>Interacting with customer</b>	PC1. call the customer based on inputs logged into customer care	<b>100</b>	3	1	2
	PC2. greet the customer and listen to their problem attentively		3	1	2
	PC3. check with customer about time for visit, field work and confirm location		4	2	2
	PC4. follow etiquette when interacting with customers as per company policy such as politeness and patience		6	2	4
	PC5. seek feedback from the customers on completion of work		4	2	2
<b>Understanding customer's requirements</b>	PC6. understand location requirement for placement of system during and after installation		2	1	1
	PC7. seek inputs to understand symptoms for the problem faced		4	2	2
	PC8. ask open and close-ended questions to understand the specific problem		4	2	2
	PC9. inform customer about the replacement or repair process		4	2	2
	PC10. enquire about warranty coverage		3	1	2
	PC11. educate about other useful products and annual maintenance contract		3	1	2
<b>Suggesting solutions</b>	PC12. summarise the problem to customer and suggest the possible solutions		5	2	3
	PC13. inform customers on whether the module has to be replaced or repaired with reasons		5	2	3
	PC14. explain the customers on time taken, repair process and possible cost for the service or inclusion under warranty		5	2	3
	PC15. seek customer's approval for further service		5	2	3
<b>Completing documentation</b>	PC16. provide note to customers about the problem(s), actions taken and the cost associated and retain a copy		5	2	3
	PC17. provide appropriate invoice for any purchase of module or parts by customer		5	2	3
<b>Achieving productivity and quality</b>	PC18. interact with customer on time within the specified Service Level Agreement (SLA) time		3	1	2
	PC19. identify the customer's requirement and identify the resources and record		3	1	2
	PC20. accurately assess the problem and suggest appropriate solutions		3	1	2
	PC21. offer the right service as per customer's requirements		3	1	2

	PC22. communicate problem effectively in order to secure customer's confidence		4	2	2
	PC23. gauge customer satisfaction with the installation and placement of device		4	2	2
	PC24. maintain no repeat or second escalation from customer		4	1	3
	PC25. achieve customer satisfaction on engagement behaviour such as listening to complaints or appropriate dressing		3	1	2
	PC26. achieve 100% customer satisfaction and positive feedback		3	1	2
		<b>TOTAL</b>	<b>100</b>	<b>40</b>	<b>60</b>
<b>ELE/N4602 Install, configure and setup hardware system</b>					
<b>Installing hardware</b>	PC1. check site conditions	<b>100</b>	1	0	1
	PC2. check and ensure any tailor-made programs required by the customer		1	0	1
	PC3. open the packaging of new product and take out the hardware carefully		1	0	1
	PC4. connect all the hardware devices such as CPU, Monitor, Keyboard, Mouse, as per the specifications of the system		2	1	1
	PC5. in case of laptop, connect battery, plug in and switch on the system		2	1	1
	PC6. follow standard operating procedure while handling hardware modules such as handling PCB with ESD standards		2	1	1
	PC7. follow the standard operating procedure for installation of each model of hardware devices and comply with them		2	1	1
	PC8. place the system at a location as preferred by customer		2	1	1
	PC9. install the hardware / devices as per standard operating procedure		2	1	1
	PC10. ensure that appropriate device and model specific procedure is followed as per installation manual		2	1	1
	PC11. maintain zero-material defect during material handling by following standard operating procedure		2	1	1
	PC12. carry tools and manuals as per installation manual		1	0	1
<b>Configuring and setting up peripherals</b>	PC13. understand the peripheral requirements of customers and ensure all hardware are available		3	1	2
	PC14. understand the placement requirement of peripheral equipment such as printers, modems, etc., as per customer preferences		3	1	2
	PC15. connect the peripheral devices with the system as per the standard procedure followed for each equipment		4	2	2
	PC16. install the peripherals, connect the appropriate peripheral such as printer, scanner to the system and run the installed program for set up		4	2	2
	PC17. follow the safety procedures while handling and installing the equipment		4	2	2



	PC18. install and configure peripherals as standard operating procedure		4	2	2
	PC19. ensure the placement of peripherals are as per customer requirement		3	1	2
<b>Setting up Software</b>	PC20. install the operating system and appropriate application software as per customer preference		5	2	3
	PC21. install additional software as per standard customer requirement		5	2	3
<b>Checking system functionality</b>	PC23. switch on the system and peripherals and check for effective functioning		2	1	1
	PC24. check and ensure the functionality of system, peripherals and applications		3	1	2
	PC25. ensure product functions are tested and demo given to the customer after hardware, software, operating system and peripheral integration with reference to the installation manual		3	1	2
	PC26. ensure that customer is satisfied		2	1	1
<b>Completing installation</b>	PC27. measure and meet multipart calls norm against benchmark		2	1	1
	PC28. complete the installation within the agreed Turn Around Time (TAT)		3	1	2
	PC29. complete the call closure in single visit		3	1	2
	PC30. complete the task with the quality benchmark of the company		2	1	1
<b>Interacting with customer</b>	PC31. understand the customer requirement and queries on the hardware		2	1	1
	PC32. educate customer on use of and procedures to be followed in operation of hardware		1	0	1
	PC33. inform customer about warranty and other terms and conditions on the hardware devices		1	0	1
	PC34. inform about cost estimates for any other new installations		2	1	1
	PC35. provide adequate information about the hardware devices, operating procedure, maintenance, etc., to the customer		1	0	1
	PC36. address the queries and issues raised by the customer on device		1	0	1
	PC37. inform customers clearly about warranty, and product terms and conditions		1	0	1
	PC38. provide customers on all the appropriate documents including invoice		1	0	1
<b>Interacting with superior</b>	PC39. understand the work requirement from superior, periodically		1	0	1
	PC40. report to superior on the work completed		1	0	1
	PC41. escalate the customer issues and problems that cannot be handled at field level		2	1	1
	PC42. document the work completed on the company ERP software for tracking and future references		1	0	1
<b>Achieving</b>	PC43. achieve 100% on-time completion of field installation with reference to agreed target and time		3	2	1

<b>productivity and quality</b>	PC44. submit feedback form on customer satisfaction level with respect to the product installation		3	2	1
	PC45. find solutions to customer complaints and queries unresolved in the field		2	1	1
	PC46. report work status and prepare documentation as per company standards		2	1	1
			<b>100</b>	<b>40</b>	<b>60</b>
<b>ELE/N4603 Troubleshoot and replace faulty module</b>					
<b>Understanding customer complaint</b>	PC1. listen carefully to concerns registered by customer at customer care		3	1	2
	PC2. interact with customer on telephone for better understanding of concern before the visit		3	1	2
	PC3. commence field trip based on type of complaint		2	1	1
	PC4. carry the troubleshooting instructions sheets		3	1	2
	PC5. understand the warranty, terms and conditions with relation to the product		3	1	2
	PC6. identify the type of problem and carry relevant tools and equipment based customer complaint and standard operating procedure		3	1	2
	PC7. assess whether replacement or repair of module may be required		3	1	2
	PC8. carry only 100% approved and verified field replaceable parts for repairing or replacing		2	1	1
	PC9. decide on whether it can be repaired in field or at company's test centre		3	1	2
<b>Identifying system level problem on field</b>	PC10. understand the problems experienced by the customer	<b>100</b>	2	1	1
	PC11. use equipment such as 'power on self test' (POST) card to identify the common errors and issues in the system which does not start up		3	1	2
	PC12. conduct root-cause analysis and identify the likely problem area		3	1	2
	PC13. disassemble and check each part of computing system such as SMPS, Memory, Hard disk to isolate the failed module		3	1	2
	PC14. follow standard operating procedure while handling hardware modules such as handling PCB with ESD standards		3	1	2
	PC15. in case of peripherals, check all parts such as print head, lens, led display to isolate faulty module		3	1	2
	PC16. make decision on whether the part can be replaced or component should be repaired		3	1	2
	PC17. identify the solution design where the module to be replaced or software to be installed or updated		3	1	2
	PC18. decide on whether to replace module or send to repair centre		2	1	1
<b>Replacing faulty</b>	PC19. if the module has to be replaced, disassemble the system, remove and replace and re-assemble the system		2	1	1

<b>module</b>	PC20. if soldering needs to be done, use manual hand soldering iron unit to solder the components or parts	3	1	2
	PC21. if there is any operating system error, software related issues, reinstal the software or fixing the issues	3	1	2
	PC22. fix the common problems faced with peripherals and networking devices	3	1	2
	PC23. escalate the problems which cannot be addressed at field level to the superior for servicing at company's repair stations	2	1	1
	PC24. coordinate with remote technical helpdesk to seek any assistance on field	2	1	1
	PC25. follow appropriate safety procedures while handling tools such as soldering iron	3	2	1
	PC26. test 100% products or functions are tested after new hardware modules or software is installed	2	1	1
<b>Completing repairs</b>	PC27. understand clearly the requirement before field visit	2	1	1
	PC28. report percentage of call closure in multiple visits against benchmark	1	1	0
	PC29. ensure no sub-standard or unverified parts are used in replacing	2	1	1
	PC30. complete the function within the agreed Turn Around Time (TAT)	2	1	1
	PC31. complete the call closure in single visit	1	1	0
	PC32. complete the task with the quality benchmark of the company	1	1	0
	PC33. meet monthly or daily target given	1	1	0
<b>Interacting with customer</b>	PC34. inform customer about the problem, action to be taken	1	0	1
	PC35. inform customer on adequate information about hardware device or software	2	1	1
	PC36. instruct customer on use of and procedures to be followed for operating the system or hardware	2	1	1
	PC37. confirm acceptance before replacing module or sending for repairs to company	1	1	0
	PC38. inform customer about warranty and other terms and conditions on the replaced or repaired hardware devices	2	1	1
	PC39. provide relevant documents to customers on completion of work	1	0	1
	PC40. achieve 100% satisfaction with customer on post sales service	1	0	1
<b>Reporting to superior</b>	PC41. receive the work order from the superior or customer care about the complaint registered	2	1	1
	PC42. report on the work load and completion status	1	0	1
	PC43. find solutions to customer complaints and queries that are unresolved in the field	2	1	1
	PC44. escalate the problems that cannot be resolved at field level with reason	1	0	1

	PC45. report 100% on time completion of field repair or hardware replacement with reference to agreed target and time or reasons for not meeting target		1	0	1
	PC46. submit the feedback form on customer satisfaction level with respect to the product repair		1	0	1
	PC47. accurately report work status through proper documentation as per company's standards		1	0	1
	PC48. create knowledge bank on the complex repairs made through documentation		1	0	1
		<b>TOTAL</b>	<b>100</b>	<b>40</b>	<b>60</b>
<b>ELE/N0009 Coordinate with colleagues</b>					
<b>Interacting with supervisors</b>	PC1. understand and assess work requirements	<b>100</b>	5	2	3
	PC2. understand the targets and incentives		5	2	3
	PC3. understand new operating procedures and constraints		5	2	3
	PC4. report problems in the field		5	2	3
	PC5. resolve personnel issues		5	2	3
	PC6. receive feedback on work standards and customer satisfaction		5	2	3
	PC7. communicate any potential hazards at a particular location		5	2	3
	PC8. meet given targets		5	2	3
	PC9. deliver work of expected quality despite constraints		5	2	3
	PC10. receive positive feedback on behaviour and attitude shown during interaction		5	2	3
<b>Coordinating with colleagues</b>	PC11. interact with colleagues from different functions and understand the nature of their work		10	4	6
	PC12. receive spares from tool room or stores; deposit faulty modules and tools to stores		10	4	6
	PC13. pass on customer complaints to colleagues in a respective geographical area		10	4	6
	PC14. assist colleagues with resolving field problems resolve conflicts and achieve smooth workflow		10	4	6
	PC15. follow the company policy during cross functional interaction		10	4	6
		<b>TOTAL</b>	<b>100</b>	<b>40</b>	<b>60</b>