

Qualification Pack



Reliability & Quality Control Manager

QP Code: TEL/Q7206

Version: 1.0

NSQF Level: 6

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TEL/Q7206: Reliability & Quality Control Manager

Brief Job Description

The individual for this job role is responsible to evaluate semiconductor products to ensure long-term reliability and consistent quality. The individual is also responsible to conduct stress tests, analyzes failure points, and implements quality control measures. In addition, he also work closely with design and manufacturing teams to recommend improvements that enhance product robustness and reduce defects.

Personal Attributes

The candidate must demonstrate attention to detail, analytical and problem-solving abilities, and effective communication skills, both written and verbal. The individual should be adept at working collaboratively with others.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [TEL/N7219: Prepare and Assemble Telecom Equipment PCBs](#)
2. [TEL/N7220: Conduct and Analyze Stress Tests for Telecom Equipment Reliability](#)
3. [TEL/N7221: Implement and Monitor Quality Control](#)
4. [TEL/N7222: Analyze Failures and Recommend Improvements](#)
5. [DGT/VSQ/N0103: Employability Skills \(90 Hours\)](#)

Qualification Pack (QP) Parameters

Sector	Telecom
Sub-Sector	Semiconductor-Manufacturing & Packaging
Occupation	Semiconductor-M&P
Country	India
NSQF Level	6
Credits	22
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3522.9900

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Minimum Educational Qualification & Experience	Completed 4 year UG program (Electronics/Telecom/IT) with 1 Year of experience relevant experience OR Completed 2nd year diploma after 12th with 4 Years of experience relevant experience OR Previous relevant Qualification of NSQF Level (5.5) with 1.5 years of experience relevant experience OR Previous relevant Qualification of NSQF Level (5) with 3 Years of experience relevant experience
Minimum Level of Education for Training in School	12th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	NA
Next Review Date	22/08/2027
NSQC Approval Date	22/08/2024
Version	1.0
Reference code on NQR	QG-06-TL-02958-2024-V1-TSSC
NQR Version	1.0

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TEL/N7219: Prepare and Assemble Telecom Equipment PCBs

Description

This OC Unit focuses on the performance required to prepare for and assemble Printed Circuit Boards (PCBs) used in Telecom Equipment. It covers activities such as reviewing work instructions, preparing workstations, assembling components according to specifications, and performing visual and functional inspections to ensure quality and first-pass yield.

Scope

The scope covers the following :

- Prepare & Assemble PCBs
- Inspect, Test, and Document PCBs

Elements and Performance Criteria

Prepare & Assemble PCBs

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

- PC1.** review work instructions and process documentation for the specific assembly operation
- PC2.** identify required materials, components, and tools
- PC3.** verify the functionality and calibration of test equipment
- PC4.** prepare the workstation for assembly, ensuring a clean and organized environment
- PC5.** pre-heat soldering equipment to the appropriate temperature (if applicable)
- PC6.** retrieve components, verifying their part numbers and specifications against the bill of materials (BOM)
- PC7.** apply solder paste to designated pads on the PCB using a stencil or dispenser (if applicable)
- PC8.** place electronic components onto the PCB accurately and according to the assembly drawing
- PC9.** soldering components using appropriate techniques (e.g., wave soldering, hand soldering)
- PC10.** clean any soldering flux residue from the PCB
- PC11.** visually inspect assembled PCBs for defects such as missing components, misaligned components, or poor soldering joints
- PC12.** perform any required rework procedures to rectify identified defects

Inspect, Test, and Document PCBs

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

- PC13.** retrieve components, verifying their part numbers and specifications against the bill of materials (BOM)
- PC14.** apply solder paste to designated pads on the PCB using a stencil or dispenser (if applicable)
- PC15.** place electronic components onto the PCB accurately and according to the assembly drawing
- PC16.** soldering components using appropriate techniques (e.g., wave soldering, hand soldering)
- PC17.** clean any soldering flux residue from the PCB
- PC18.** visually inspect assembled PCBs for defects such as missing components, misaligned components, or poor soldering joints

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- PC19.** record assembly activities in accordance with company procedures (e.g., completing assembly logs, updating production control systems)
- PC20.** maintain accurate records of materials used, test results, and any non-conformances encountered
- PC21.** file completed documentation according to established filing systems

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** function and purpose of various electronic components (resistors, capacitors, transistors, integrated circuits, etc.)
- KU2.** component specifications and datasheets
- KU3.** proper handling and storage procedures for electronic components
- KU4.** different types of soldering techniques (wave soldering, hand soldering, etc.)
- KU5.** soldering materials and equipment (solder paste, flux, soldering irons, etc.)
- KU6.** safe soldering practices
- KU7.** assembly procedures and sequence according to work instructions and drawings
- KU8.** bill of Materials (BOM) and its role in assembly
- KU9.** surface Mount Technology (SMT) and Through-Hole Technology (THT) assembly processes
- KU10.** quality standards for PCB assembly (e.g., IPC standards)
- KU11.** operation of various test equipment used for assembled PCBs (functional testers, in-circuit testers, etc.)
- KU12.** interpretation of test results and identification of failures
- KU13.** company procedures for documenting assembly activities (assembly logs, production control systems)
- KU14.** maintaining accurate records of materials used, test results, and non-conformances
- KU15.** proper filing systems for assembly documentation
- KU16.** electrostatic Discharge (ESD) control procedures
- KU17.** safe handling of hazardous materials (solder, flux, etc.)
- KU18.** importance of maintaining a clean and safe work environment

Generic Skills (GS)

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

- GS1.** maintain work-related notes and records
- GS2.** read the relevant literature to get the latest updates about the field of work
- GS3.** listen attentively to understand the information/ instructions being shared
- GS4.** communicate politely and professionally
- GS5.** plan and prioritize tasks to ensure timely completion
- GS6.** coordinate with the co-workers to achieve the work objectives
- GS7.** evaluate all possible solutions to a problem to select the best one

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GS8. take quick decisions to deal with workplace emergencies/ accidents

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare & Assemble PCBs</i>	18	30	-	5
PC1. review work instructions and process documentation for the specific assembly operation	2	2	-	-
PC2. identify required materials, components, and tools	2	3	-	1
PC3. verify the functionality and calibration of test equipment	2	3	-	-
PC4. prepare the workstation for assembly, ensuring a clean and organized environment	1	2	-	-
PC5. pre-heat soldering equipment to the appropriate temperature (if applicable)	1	2	-	-
PC6. retrieve components, verifying their part numbers and specifications against the bill of materials (BOM)	1	2	-	-
PC7. apply solder paste to designated pads on the PCB using a stencil or dispenser (if applicable)	1	2	-	-
PC8. place electronic components onto the PCB accurately and according to the assembly drawing	2	3	-	1
PC9. soldering components using appropriate techniques (e.g., wave soldering, hand soldering)	2	3	-	1
PC10. clean any soldering flux residue from the PCB	1	2	-	-
PC11. visually inspect assembled PCBs for defects such as missing components, misaligned components, or poor soldering joints	1	2	-	1
PC12. perform any required rework procedures to rectify identified defects	2	4	-	1
<i>Inspect, Test, and Document PCBs</i>	12	30	-	5

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. retrieve components, verifying their part numbers and specifications against the bill of materials (BOM)	1	3	-	1
PC14. apply solder paste to designated pads on the PCB using a stencil or dispenser (if applicable)	1	3	-	-
PC15. place electronic components onto the PCB accurately and according to the assembly drawing	1	5	-	1
PC16. soldering components using appropriate techniques (e.g., wave soldering, hand soldering)	3	5	-	1
PC17. clean any soldering flux residue from the PCB	2	3	-	-
PC18. visually inspect assembled PCBs for defects such as missing components, misaligned components, or poor soldering joints	1	3	-	1
PC19. record assembly activities in accordance with company procedures (e.g., completing assembly logs, updating production control systems)	1	3	-	-
PC20. maintain accurate records of materials used, test results, and any non-conformances encountered	1	3	-	1
PC21. file completed documentation according to established filing systems	1	2	-	-
NOS Total	30	60	-	10

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National Occupational Standards (NOS) Parameters

NOS Code	TEL/N7219
NOS Name	Prepare and Assemble Telecom Equipment PCBs
Sector	Telecom
Sub-Sector	
Occupation	Semiconductor-M&P
NSQF Level	6
Credits	6
Version	1.0
Last Reviewed Date	22/08/2024
Next Review Date	22/08/2027
NSQC Clearance Date	22/08/2024

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TEL/N7220: Conduct and Analyze Stress Tests for Telecom Equipment Reliability

Description

This OS equips individuals to design, conduct, and analyze stress tests for telecom equipment reliability. It covers designing stress profiles, using test equipment, analyzing data, and recommending improvements.

Scope

The scope covers the following :

- Design and Prepare for Stress Testing
- Conduct and Monitor Stress Tests
- Analyze Failure Data and Recommend Improvements

Elements and Performance Criteria

Design and Prepare for Stress Testing

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

- PC1.** review product specifications and identify critical performance parameters (e.g., power consumption, signal integrity, data throughput)
- PC2.** research industry standards and regulations relevant to telecom equipment reliability testing (e.g., Telcordia GR series)
- PC3.** analyze typical environmental and operational conditions for targeted telecom applications (e.g., temperature range, humidity levels, vibration profiles)
- PC4.** design stress test profiles that simulate combinations of these conditions, exceeding expected operational limits to induce failures
- PC5.** select appropriate stress test equipment based on the designed profiles (e.g., temperature chambers, vibration tables, electrical stress testers)
- PC6.** configure the chosen test equipment according to the specific stress test profile requirements
- PC7.** prepare test fixtures and adapters to securely hold and interface with telecom equipment samples during testing
- PC8.** develop data acquisition plans for capturing and recording relevant test parameters throughout the stress test process

Conduct and Monitor Stress Tests

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

- PC9.** calibrate and verify the functionality of stress test equipment before use
- PC10.** prepare and pre-condition telecom equipment samples for stress testing according to established procedures
- PC11.** integrate the telecom equipment samples into the designed test setup using prepared fixtures and adapters
- PC12.** initiate and execute stress tests following defined protocols and safety guidelines

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- PC13.** monitor test data in real-time, identifying any anomalies or deviations from expected behavior
- PC14.** document observations and record test data using designated software or data logging systems
- PC15.** continuously monitor test equipment performance and adjust settings if necessary to maintain the stress profile
- PC16.** terminate stress tests upon reaching predetermined test durations or upon equipment failure
- PC17.** visually inspect and document any physical damage or changes observed in the tested equipment samples

Analyze Failure Data and Recommend Improvements

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

- PC18.** compile and organize failure data from completed stress tests (e.g., time-to-failure, failure modes, operating conditions at failure)
- PC19.** apply statistical techniques (e.g., Weibull analysis, Pareto charts) to analyze failure data and identify trends or patterns in failure occurrences
- PC20.** perform root cause analysis to determine the underlying reasons for equipment failures, considering design weaknesses, material deficiencies, or manufacturing defects
- PC21.** utilize various tools and techniques (e.g., FMEA, FTA) to identify potential failure mechanisms that could be triggered under different stress conditions
- PC22.** based on the root cause analysis, propose corrective actions to address identified weaknesses and prevent similar failures in future product revisions
- PC23.** evaluate the feasibility and cost-effectiveness of potential corrective actions considering design changes, material selection, or manufacturing process modifications
- PC24.** recommend preventive actions to be implemented in the design or manufacturing process to minimize future failures (e.g., derating components, adding thermal management features)
- PC25.** document recommendations for corrective and preventive actions in a clear and concise report with supporting data and analysis results
- PC26.** collaborate with design and manufacturing teams to present findings and discuss the implementation of agreed-upon corrective and preventive actions to enhance product reliability

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** functionality and critical performance parameters of various types of telecom equipment (e.g., routers, switches, base stations)
- KU2.** industry standards and regulations related to telecom equipment reliability testing
- KU3.** typical environmental conditions for telecom equipment deployment (e.g., temperature range, humidity levels, vibration)
- KU4.** operational stresses experienced by telecom equipment in various applications
- KU5.** principles of stress testing and its role in evaluating product reliability
- KU6.** different types of stress tests (e.g., environmental stress testing, electrical stress testing, thermal cycling)

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- KU7.** design of effective stress test profiles to simulate real-world conditions and induce failures.
- KU8.** operation and functionality of various stress test equipment (e.g., temperature chambers, vibration tables, electrical stress testers)
- KU9.** calibration procedures for stress test equipment to ensure accurate and reliable data.
- KU10.** data acquisition techniques for capturing and recording relevant test parameters during stress testing
- KU11.** statistical techniques for analyzing failure data (e.g., Weibull analysis, Pareto charts) to identify trends and patterns
- KU12.** techniques for performing root cause analysis to determine the underlying reasons for equipment failures
- KU13.** failure modes and mechanisms commonly observed in telecom equipment
- KU14.** principles of reliability engineering and their application to product design and improvement
- KU15.** techniques for implementing corrective and preventive actions to enhance product reliability
- KU16.** effective communication skills for presenting findings and recommendations to design and manufacturing teams
- KU17.** importance of collaboration with other departments to implement corrective and preventive actions
- KU18.** safe operation procedures for stress test equipment, following established safety guidelines
- KU19.** potential hazards associated with stress testing and appropriate safety precautions

Generic Skills (GS)

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

- GS1.** maintain work related records
- GS2.** read the relevant guides and literature to get the latest information about the field of work
- GS3.** communicate clearly and politely
- GS4.** listen attentively to understand the information/instructions being shared
- GS5.** plan and prioritize tasks to ensure timely completion
- GS6.** identify appropriate solutions to work related issues
- GS7.** take quick decisions in case of an emergency/accident

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Design and Prepare for Stress Testing</i>	12	16	-	5
PC1. review product specifications and identify critical performance parameters (e.g., power consumption, signal integrity, data throughput)	2	2	-	1
PC2. research industry standards and regulations relevant to telecom equipment reliability testing (e.g., Telcordia GR series)	1	1	-	-
PC3. analyze typical environmental and operational conditions for targeted telecom applications (e.g., temperature range, humidity levels, vibration profiles)	1	1	-	-
PC4. design stress test profiles that simulate combinations of these conditions, exceeding expected operational limits to induce failures	2	2	-	2
PC5. select appropriate stress test equipment based on the designed profiles (e.g., temperature chambers, vibration tables, electrical stress testers)	1	2	-	-
PC6. configure the chosen test equipment according to the specific stress test profile requirements	2	3	-	1
PC7. prepare test fixtures and adapters to securely hold and interface with telecom equipment samples during testing	2	3	-	-
PC8. develop data acquisition plans for capturing and recording relevant test parameters throughout the stress test process	1	2	-	1
<i>Conduct and Monitor Stress Tests</i>	13	16	-	1
PC9. calibrate and verify the functionality of stress test equipment before use	2	2	-	1
PC10. prepare and pre-condition telecom equipment samples for stress testing according to established procedures	2	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. integrate the telecom equipment samples into the designed test setup using prepared fixtures and adapters	2	2	-	-
PC12. initiate and execute stress tests following defined protocols and safety guidelines	1	2	-	-
PC13. monitor test data in real-time, identifying any anomalies or deviations from expected behavior	1	1	-	-
PC14. document observations and record test data using designated software or data logging systems	2	2	-	-
PC15. continuously monitor test equipment performance and adjust settings if necessary to maintain the stress profile	1	2	-	-
PC16. terminate stress tests upon reaching predetermined test durations or upon equipment failure	2	2	-	-
PC17. visually inspect and document any physical damage or changes observed in the tested equipment samples	-	1	-	-
<i>Analyze Failure Data and Recommend Improvements</i>	15	18	-	4
PC18. compile and organize failure data from completed stress tests (e.g., time-to-failure, failure modes, operating conditions at failure)	2	2	-	1
PC19. apply statistical techniques (e.g., Weibull analysis, Pareto charts) to analyze failure data and identify trends or patterns in failure occurrences	2	2	-	-
PC20. perform root cause analysis to determine the underlying reasons for equipment failures, considering design weaknesses, material deficiencies, or manufacturing defects	2	3	-	1
PC21. utilize various tools and techniques (e.g., FMEA, FTA) to identify potential failure mechanisms that could be triggered under different stress conditions	2	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. based on the root cause analysis, propose corrective actions to address identified weaknesses and prevent similar failures in future product revisions	2	3	-	-
PC23. evaluate the feasibility and cost-effectiveness of potential corrective actions considering design changes, material selection, or manufacturing process modifications	1	2	-	-
PC24. recommend preventive actions to be implemented in the design or manufacturing process to minimize future failures (e.g., derating components, adding thermal management features)	1	1	-	2
PC25. document recommendations for corrective and preventive actions in a clear and concise report with supporting data and analysis results	2	1	-	-
PC26. collaborate with design and manufacturing teams to present findings and discuss the implementation of agreed-upon corrective and preventive actions to enhance product reliability	1	2	-	-
NOS Total	40	50	-	10

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National Occupational Standards (NOS) Parameters

NOS Code	TEL/N7220
NOS Name	Conduct and Analyze Stress Tests for Telecom Equipment Reliability
Sector	Telecom
Sub-Sector	
Occupation	Semiconductor-M&P
NSQF Level	6
Credits	7
Version	1.0
Last Reviewed Date	22/08/2024
Next Review Date	22/08/2027
NSQC Clearance Date	22/08/2024

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TEL/N7221: Implement and Monitor Quality Control

Description

This OS unit trains to implement and monitor quality control in telecom equipment assembly. It covers developing plans, using SPC, conducting audits, analyzing data, and recommending improvements, ensuring high-quality equipment.

Scope

The scope covers the following :

- Develop, Implement, and Manage Quality Control Systems
- Conduct Audits, Analyze Data, and Report for Improvement

Elements and Performance Criteria

Develop, Implement, and Manage Quality Control Systems

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

- PC1.** analyze customer specifications to identify quality requirements for assembled telecom equipment (e.g., functionality, performance, materials)
- PC2.** research and identify relevant industry standards for telecom equipment quality control (e.g., IPC standards for soldering)
- PC3.** develop inspection points throughout the assembly process that focus on critical quality characteristics of the equipment
- PC4.** define clear acceptance criteria for each inspection point, specifying the acceptable range for parameters like component placement or soldering quality
- PC5.** establish corrective action procedures for identified non-conformances, outlining steps to resolve issues and prevent recurrence
- PC6.** select appropriate quality control tools and techniques based on the assembly process and identified risks (e.g., checklists for visual inspections, control charts for monitoring process parameters)
- PC7.** develop clear and concise documentation of the chosen quality control procedures, ensuring easy understanding and consistent application
- PC8.** train assembly personnel on the established quality control plans, procedures, and associated tools
- PC9.** conduct periodic refresher training to ensure ongoing knowledge and proper implementation of quality control procedures
- PC10.** identify critical process parameters for each stage of the telecom equipment assembly process (e.g., soldering temperature, component placement accuracy, torque applied to fasteners)
- PC11.** develop data collection plans that specify the frequency and method of collecting data for these critical process parameters
- PC12.** implement data collection procedures, ensuring accurate and reliable data gathering throughout production

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- PC13.** utilize statistical process control (SPC) techniques to analyze collected data (e.g., control charts, histograms) and identify any trends or deviations from established control limits
- PC14.** analyze the root cause of identified process variations and implement corrective actions to bring the process back within control limits
- PC15.** maintain control charts and document any corrective actions taken to address process variations

Conduct Audits, Analyze Data, and Report for Improvement

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

- PC16.** develop and schedule internal quality audits of the telecom equipment assembly process based on a risk assessment, prioritizing areas with higher potential for quality issues
- PC17.** conduct audits according to defined procedures, verifying adherence to established quality control plans and identifying any deviations or non-conformances
- PC18.** perform regular inspections of assembly workstations, equipment, and materials to proactively identify potential quality problems before they occur
- PC19.** document audit and inspection findings, including detailed descriptions of any non-conformances observed
- PC20.** analyze audit and inspection data to identify recurring issues and opportunities for improvement in the quality control system
- PC21.** collect and consolidate quality data from various sources (e.g., inspection records, SPC charts, customer feedback, warranty claims)
- PC22.** analyze trends and patterns in quality data to identify areas for improvement in the assembly process or product design
- PC23.** utilize data visualization techniques (e.g., Pareto charts) to effectively communicate key quality metrics and improvement opportunities
- PC24.** prepare comprehensive quality reports that summarize key metrics, trends, corrective actions implemented, and recommendations for further improvement
- PC25.** communicate quality data and findings to relevant personnel (e.g., production supervisors, management, design teams) to facilitate informed decision-making

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** principles and methodologies of quality control and quality management
- KU2.** importance of customer specifications and industry standards for telecom equipment quality
- KU3.** operation and application of various quality control tools (e.g., checklists, control charts, inspection gauges)
- KU4.** statistical process control (SPC) techniques for analyzing process data and identifying variations
- KU5.** critical process parameters for different stages of telecom equipment assembly (e.g., soldering temperature, component placement)
- KU6.** techniques for data collection and analysis of process parameters
- KU7.** procedures for identifying, documenting, and resolving non-conformances in the assembly process

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- KU8.** root cause analysis techniques to identify the underlying reasons for quality issues
- KU9.** techniques for analyzing quality data from various sources (e.g., inspections, SPC charts).
- KU10.** data visualization techniques (e.g., Pareto charts) for effective communication of quality information.
- KU11.** importance of clear and accurate documentation of quality control procedures and data.
- KU12.** procedures for maintaining quality records and reports
- KU13.** effective communication skills for reporting quality data and findings to relevant personnel (e.g., production supervisors, management, design teams)
- KU14.** importance of collaboration with other departments (e.g., design, production) for continuous improvement of quality control systems

Generic Skills (GS)

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

- GS1.** maintain work related records
- GS2.** read the relevant guides and literature to get the latest information about the field of work
- GS3.** communicate clearly and politely
- GS4.** listen attentively to understand the information/instructions being shared
- GS5.** plan and prioritize tasks to ensure timely completion
- GS6.** identify appropriate solutions to work related issues
- GS7.** take quick decisions in case of an emergency/accident

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Develop, Implement, and Manage Quality Control Systems</i>	18	30	-	5
PC1. analyze customer specifications to identify quality requirements for assembled telecom equipment (e.g., functionality, performance, materials)	1	2	-	1
PC2. research and identify relevant industry standards for telecom equipment quality control (e.g., IPC standards for soldering)	1	2	-	-
PC3. develop inspection points throughout the assembly process that focus on critical quality characteristics of the equipment	1	2	-	-
PC4. define clear acceptance criteria for each inspection point, specifying the acceptable range for parameters like component placement or soldering quality	1	2	-	1
PC5. establish corrective action procedures for identified non-conformances, outlining steps to resolve issues and prevent recurrence	1	2	-	-
PC6. select appropriate quality control tools and techniques based on the assembly process and identified risks (e.g., checklists for visual inspections, control charts for monitoring process parameters)	1	2	-	-
PC7. develop clear and concise documentation of the chosen quality control procedures, ensuring easy understanding and consistent application	1	2	-	-
PC8. train assembly personnel on the established quality control plans, procedures, and associated tools	1	2	-	-
PC9. conduct periodic refresher training to ensure ongoing knowledge and proper implementation of quality control procedures	2	3	-	1

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. identify critical process parameters for each stage of the telecom equipment assembly process (e.g., soldering temperature, component placement accuracy, torque applied to fasteners)	2	2	-	1
PC11. develop data collection plans that specify the frequency and method of collecting data for these critical process parameters	1	2	-	-
PC12. implement data collection procedures, ensuring accurate and reliable data gathering throughout production	1	2	-	-
PC13. utilize statistical process control (SPC) techniques to analyze collected data (e.g., control charts, histograms) and identify any trends or deviations from established control limits	1	2	-	-
PC14. analyze the root cause of identified process variations and implement corrective actions to bring the process back within control limits	2	2	-	1
PC15. maintain control charts and document any corrective actions taken to address process variations	1	1	-	-
<i>Conduct Audits, Analyze Data, and Report for Improvement</i>	12	30	-	5
PC16. develop and schedule internal quality audits of the telecom equipment assembly process based on a risk assessment, prioritizing areas with higher potential for quality issues	1	3	-	-
PC17. conduct audits according to defined procedures, verifying adherence to established quality control plans and identifying any deviations or non-conformances	1	4	-	1
PC18. perform regular inspections of assembly workstations, equipment, and materials to proactively identify potential quality problems before they occur	1	3	-	-
PC19. document audit and inspection findings, including detailed descriptions of any non-conformances observed	2	4	-	1

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. analyze audit and inspection data to identify recurring issues and opportunities for improvement in the quality control system	2	3	-	-
PC21. collect and consolidate quality data from various sources (e.g., inspection records, SPC charts, customer feedback, warranty claims)	1	3	-	-
PC22. analyze trends and patterns in quality data to identify areas for improvement in the assembly process or product design	1	2	-	1
PC23. utilize data visualization techniques (e.g., Pareto charts) to effectively communicate key quality metrics and improvement opportunities	1	3	-	-
PC24. prepare comprehensive quality reports that summarize key metrics, trends, corrective actions implemented, and recommendations for further improvement	1	2	-	1
PC25. communicate quality data and findings to relevant personnel (e.g., production supervisors, management, design teams) to facilitate informed decision-making	1	3	-	1
NOS Total	30	60	-	10

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National Occupational Standards (NOS) Parameters

NOS Code	TEL/N7221
NOS Name	Implement and Monitor Quality Control
Sector	Telecom
Sub-Sector	
Occupation	Semiconductor-M&P
NSQF Level	6
Credits	3
Version	1.0
Last Reviewed Date	22/08/2024
Next Review Date	22/08/2027
NSQC Clearance Date	22/08/2024

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TEL/N7222: Analyze Failures and Recommend Improvements

Description

This OS unit equips individuals to analyze and troubleshoot failures in telecom equipment. It includes clear documentation and collaboration with other teams to ensure effective implementation of solutions.

Scope

The scope covers the following :

- Perform Failure Analysis and Identify Root Cause
- Recommend Improvements and Communicate Findings

Elements and Performance Criteria

Perform Failure Analysis and Identify Root Cause

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

- PC1.** receive and document failed telecom equipment samples
- PC2.** conduct visual inspections to identify potential physical defects or anomalies (e.g., burn marks, damaged components)
- PC3.** utilize X-ray analysis or other non-destructive testing techniques to examine internal structures for hidden defects
- PC4.** perform electrical testing to assess functionality and identify electrical faults or abnormal parameters
- PC5.** analyze collected data from various tests to identify the most likely failure mode (e.g., short circuit, overheating)
- PC6.** employ root cause analysis techniques (e.g., FMEA, FTA) to determine the underlying reasons for the failure mode
- PC7.** consider factors such as design weaknesses, material deficiencies, or manufacturing process variations during root cause analysis

Recommend Improvements and Communicate Findings

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

- PC8.** propose corrective actions to address the identified failure mechanism and prevent similar failures in future product revisions based on the root cause analysis
- PC9.** evaluate the feasibility and cost-effectiveness of potential corrective actions (e.g., design changes, material selection, process modifications)
- PC10.** recommend preventive actions to be implemented in the design or manufacturing process to minimize future failures (e.g., adding redundancy, derating components)
- PC11.** develop a clear and concise report documenting the failure analysis process, findings, root cause, and recommended corrective and preventive actions
- PC12.** collaborate with design and manufacturing teams to present findings and discuss the implementation of agreed-upon corrective and preventive actions
- PC13.** develop clear and concise reports or presentations summarizing failure analysis findings, root causes, and recommended corrective/preventive actions

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- PC14.** effectively present failure analysis results to relevant personnel (e.g., design engineers, production supervisors, quality control personnel)
- PC15.** actively participate in discussions and collaborate with other teams (design, manufacturing) to develop and implement agreed-upon corrective and preventive actions based on the analysis.
- PC16.** communicate technical information related to failures and improvement opportunities in a way that is understandable to a diverse audience
- PC17.** document communication activities and progress made towards implementing corrective and preventive actions

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** principles and operation of various failure analysis techniques (visual inspection, X-ray analysis, electrical testing)
- KU2.** data analysis methods for interpreting results from different testing methods.
- KU3.** techniques for root cause analysis (e.g., FMEA, FTA) to identify underlying reasons for equipment failures.
- KU4.** common failure modes observed in telecom equipment (e.g., overheating, short circuits).
- KU5.** functional principles and components of various types of telecom equipment
- KU6.** potential design weaknesses that could contribute to equipment failures
- KU7.** properties of materials commonly used in telecom equipment (e.g., electrical conductivity, thermal resistance)
- KU8.** how material deficiencies can lead to equipment failures
- KU9.** different manufacturing processes used in telecom equipment assembly (e.g., soldering, component placement)
- KU10.** how variations in manufacturing processes can impact equipment reliability
- KU11.** strategies for developing effective corrective actions to address identified failure mechanisms
- KU12.** techniques for implementing preventive actions in design or manufacturing to minimize future failures
- KU13.** importance of clear and concise technical communication for presenting failure analysis findings
- KU14.** effective collaboration skills for working with design and manufacturing teams to implement corrective and preventive actions

Generic Skills (GS)

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

- GS1.** maintain work related records
- GS2.** read the relevant guides and literature to get the latest information about the field of work
- GS3.** communicate clearly and politely

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- GS4.** listen attentively to understand the information/instructions being shared
- GS5.** plan and prioritize tasks to ensure timely completion
- GS6.** identify appropriate solutions to work related issues
- GS7.** take quick decisions in case of an emergency/accident

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Perform Failure Analysis and Identify Root Cause</i>	18	34	-	5
PC1. receive and document failed telecom equipment samples	2	4	-	1
PC2. conduct visual inspections to identify potential physical defects or anomalies (e.g., burn marks, damaged components)	2	4	-	1
PC3. utilize X-ray analysis or other non-destructive testing techniques to examine internal structures for hidden defects	3	5	-	1
PC4. perform electrical testing to assess functionality and identify electrical faults or abnormal parameters	2	6	-	1
PC5. analyze collected data from various tests to identify the most likely failure mode (e.g., short circuit, overheating)	3	4	-	1
PC6. employ root cause analysis techniques (e.g., FMEA, FTA) to determine the underlying reasons for the failure mode	3	5	-	-
PC7. consider factors such as design weaknesses, material deficiencies, or manufacturing process variations during root cause analysis	3	6	-	-
<i>Recommend Improvements and Communicate Findings</i>	12	26	-	5
PC8. propose corrective actions to address the identified failure mechanism and prevent similar failures in future product revisions based on the root cause analysis	1	2	-	-
PC9. evaluate the feasibility and cost-effectiveness of potential corrective actions (e.g., design changes, material selection, process modifications)	2	4	-	1
PC10. recommend preventive actions to be implemented in the design or manufacturing process to minimize future failures (e.g., adding redundancy, derating components)	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. develop a clear and concise report documenting the failure analysis process, findings, root cause, and recommended corrective and preventive actions	2	3	-	1
PC12. collaborate with design and manufacturing teams to present findings and discuss the implementation of agreed-upon corrective and preventive actions	1	2	-	1
PC13. develop clear and concise reports or presentations summarizing failure analysis findings, root causes, and recommended corrective/preventive actions	1	2	-	1
PC14. effectively present failure analysis results to relevant personnel (e.g., design engineers, production supervisors, quality control personnel)	1	3	-	1
PC15. actively participate in discussions and collaborate with other teams (design, manufacturing) to develop and implement agreed-upon corrective and preventive actions based on the analysis.	1	2	-	-
PC16. communicate technical information related to failures and improvement opportunities in a way that is understandable to a diverse audience	1	3	-	-
PC17. document communication activities and progress made towards implementing corrective and preventive actions	1	2	-	-
NOS Total	30	60	-	10

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National Occupational Standards (NOS) Parameters

NOS Code	TEL/N7222
NOS Name	Analyze Failures and Recommend Improvements
Sector	Telecom
Sub-Sector	
Occupation	Semiconductor-M&P
NSQF Level	6
Credits	3
Version	1.0
Last Reviewed Date	22/08/2024
Next Review Date	22/08/2027
NSQC Clearance Date	22/08/2024

Qualification Pack

DGT/VSQ/N0103: Employability Skills (90 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

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

- PC1.** understand the significance of employability skills in meeting the current job market requirement and future of work
- PC2.** identify and explore learning and employability relevant portals
- PC3.** research about the different industries, job market trends, latest skills required and the available opportunities

Constitutional values – Citizenship

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

- PC4.** recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.
- PC5.** follow environmentally sustainable practices

Becoming a Professional in the 21st Century

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

- PC6.** recognize the significance of 21st Century Skills for employment

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- PC7.** practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life
- PC8.** adopt a continuous learning mindset for personal and professional development

Basic English Skills

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

- PC9.** use basic English for everyday conversation in different contexts, in person and over the telephone
- PC10.** read and understand routine information, notes, instructions, mails, letters etc. written in English
- PC11.** write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

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

- PC12.** identify career goals based on the skills, interests, knowledge, and personal attributes
- PC13.** prepare a career development plan with short- and long-term goals

Communication Skills

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

- PC14.** follow verbal and non-verbal communication etiquette while communicating in professional and public settings
- PC15.** use active listening techniques for effective communication
- PC16.** communicate in writing using appropriate style and format based on formal or informal requirements
- PC17.** work collaboratively with others in a team

Diversity & Inclusion

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

- PC18.** communicate and behave appropriately with all genders and PwD
- PC19.** escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

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

- PC20.** identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.
- PC21.** carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook
- PC22.** identify common components of salary and compute income, expenses, taxes, investments etc
- PC23.** identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

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

- PC24.** operate digital devices and use their features and applications securely and safely
- PC25.** carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.
- PC26.** display responsible online behaviour while using various social media platforms

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- PC27.** create a personal email account, send and process received messages as per requirement
- PC28.** carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications
- PC29.** utilize virtual collaboration tools to work effectively

Entrepreneurship

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

- PC30.** identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research
- PC31.** develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion
- PC32.** identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

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

- PC33.** identify different types of customers and ways to communicate with them
- PC34.** identify and respond to customer requests and needs in a professional manner
- PC35.** use appropriate tools to collect customer feedback
- PC36.** follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

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

- PC37.** create a professional Curriculum vitae (Résumé)
- PC38.** search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively
- PC39.** apply to identified job openings using offline /online methods as per requirement
- PC40.** answer questions politely, with clarity and confidence, during recruitment and selection
- PC41.** identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** need for employability skills and different learning and employability related portals
- KU2.** various constitutional and personal values
- KU3.** different environmentally sustainable practices and their importance
- KU4.** Twenty first (21st) century skills and their importance
- KU5.** how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up
- KU6.** importance of career development and setting long- and short-term goals
- KU7.** about effective communication
- KU8.** POSH Act
- KU9.** Gender sensitivity and inclusivity
- KU10.** different types of financial institutes, products, and services

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- KU11.** components of salary and how to compute income and expenditure
- KU12.** importance of maintaining safety and security in offline and online financial transactions
- KU13.** different legal rights and laws
- KU14.** different types of digital devices and the procedure to operate them safely and securely
- KU15.** how to create and operate an e- mail account
- KU16.** use applications such as word processors, spreadsheets etc.
- KU17.** how to identify business opportunities
- KU18.** types and needs of customers
- KU19.** how to apply for a job and prepare for an interview
- KU20.** apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

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

- GS1.** read and write different types of documents/instructions/correspondence in English and other languages
- GS2.** communicate effectively using appropriate language in formal and informal settings
- GS3.** behave politely and appropriately with all to maintain effective work relationship
- GS4.** how to work in a virtual mode, using various technological platforms
- GS5.** perform calculations efficiently
- GS6.** solve problems effectively
- GS7.** pay attention to details
- GS8.** manage time efficiently
- GS9.** maintain hygiene and sanitization to avoid infection

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Introduction to Employability Skills</i>	1	1	-	-
PC1. understand the significance of employability skills in meeting the current job market requirement and future of work	-	-	-	-
PC2. identify and explore learning and employability relevant portals	-	-	-	-
PC3. research about the different industries, job market trends, latest skills required and the available opportunities	-	-	-	-
<i>Constitutional values – Citizenship</i>	1	1	-	-
PC4. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC5. follow environmentally sustainable practices	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	1	3	-	-
PC6. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC7. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
PC8. adopt a continuous learning mindset for personal and professional development	-	-	-	-
<i>Basic English Skills</i>	3	4	-	-
PC9. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC11. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
<i>Career Development & Goal Setting</i>	1	2	-	-
PC12. identify career goals based on the skills, interests, knowledge, and personal attributes	-	-	-	-
PC13. prepare a career development plan with short- and long-term goals	-	-	-	-
<i>Communication Skills</i>	2	2	-	-
PC14. follow verbal and non-verbal communication etiquette while communicating in professional and public settings	-	-	-	-
PC15. use active listening techniques for effective communication	-	-	-	-
PC16. communicate in writing using appropriate style and format based on formal or informal requirements	-	-	-	-
PC17. work collaboratively with others in a team	-	-	-	-
<i>Diversity & Inclusion</i>	1	1	-	-
PC18. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC19. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	2	3	-	-
PC20. identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.	-	-	-	-
PC21. carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook	-	-	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC23. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	3	5	-	-
PC24. operate digital devices and use their features and applications securely and safely	-	-	-	-
PC25. carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.	-	-	-	-
PC26. display responsible online behaviour while using various social media platforms	-	-	-	-
PC27. create a personal email account, send and process received messages as per requirement	-	-	-	-
PC28. carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications	-	-	-	-
PC29. utilize virtual collaboration tools to work effectively	-	-	-	-
<i>Entrepreneurship</i>	2	3	-	-
PC30. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC31. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC32. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
<i>Customer Service</i>	1	2	-	-
PC33. identify different types of customers and ways to communicate with them	-	-	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC34. identify and respond to customer requests and needs in a professional manner	-	-	-	-
PC35. use appropriate tools to collect customer feedback	-	-	-	-
PC36. follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship & Jobs</i>	2	3	-	-
PC37. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC38. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC39. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC40. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC41. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	20	30	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0103
NOS Name	Employability Skills (90 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	5
Credits	3
Version	1.0
Last Reviewed Date	18/02/2025
Next Review Date	18/02/2028
NSQC Clearance Date	18/02/2025

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/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 Element/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 center (as per assessment criteria below).

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5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.

6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass 70% aggregate for the QP.

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

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
TEL/N7219.Prepare and Assemble Telecom Equipment PCBs	30	60	-	10	100	20
TEL/N7220.Conduct and Analyze Stress Tests for Telecom Equipment Reliability	40	50	-	10	100	25
TEL/N7221.Implement and Monitor Quality Control	30	60	-	10	100	25
TEL/N7222.Analyze Failures and Recommend Improvements	30	60	-	10	100	20
DGT/VSQ/N0103.Employability Skills (90 Hours)	20	30	-	-	50	10
Total	150	260	-	40	450	100

Qualification Pack

Acronyms

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

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Glossary

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

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