Qualification Pack

Telecom Electrician (Advanced)

QP Code: TEL/Q4303

Version: 1.0

NSQF Level: 4

Telecom || 3rd Floor, Plot No 126, Sector - 44
Gurgaon - 122003 || email:QAteam@tsscindia.com

Contents

TEL/Q4303: Telecom Electrician (Advanced) 3
Brief Job Description 3
Applicable National Occupational Standards (NOS) 3
Compulsory NOS 3
Qualification Pack (QP) Parameters 3
TEL/N4301: Install and Maintain Inverter and Battery Banks 5
TEL/N4302: Design and Install One-Phase and Three-Phase Electrical Systems at cell site 12
TEL/N4303: Install, Maintain, and Troubleshoot Electrical Components 19
TEL/N4304: Upgrade electrical systems to meet capacity and power quality requirements 28
TEL/N4305: Develop and implement telecom electrical standards 37
TEL/N9101: Organize Work and Resources as per Health and Safety Standards 44
DGT/VSQ/N0102: Employability Skills (60 Hours) 51
Assessment Guidelines and Weightage 58
Assessment Guidelines 58
Assessment Weightage 59
Acronyms 60
Glossary 61

Qualification Pack

TEL/Q4303: Telecom Electrician (Advanced)

Brief Job Description

The individual in this job role is responsible for installing and maintaining inverters and battery banks, designing and installing one-phase and three-phase electrical systems at cell sites. The individual also ensures efficient and reliable telecommunications operations by troubleshooting, inspecting, and adhering to safety protocols.

Personal Attributes

This individual must have good communication skills with a clear diction, regional language proficiency, strong customer service focus and pleasant personality. They should be self-motivated, should be able to apply practical judgment to successfully perform the assigned responsibilities. The individual should also be of working in high-pressure situations in field which may consist of difficult terrain.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. TEL/N4301: Install and Maintain Inverter and Battery Banks
2. TEL/N4302: Design and Install One-Phase and Three-Phase Electrical Systems at cell site
3. TEL/N4303: Install, Maintain, and Troubleshoot Electrical Components
4. TEL/N4304: Upgrade electrical systems to meet capacity and power quality requirements
5. TEL/N4305: Develop and implement telecom electrical standards
6. TEL/N9101: Organize Work and Resources as per Health and Safety Standards
7. DGT/VSQ/N0102: Employability Skills (60 Hours)

Qualification Pack (QP) Parameters

Sector	Telecom
Sub-Sector	Passive Infrastructure
Occupation	Customer Service - Passive Infrastructure
Country	India

Qualification Pack

NSQF Level	4
Credits	15
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7422.9900
Minimum Educational Qualification & Experience	12th grade Pass (Science or Equivalent) with 1 Year of experience in relevant field OR 11th grade pass (Science or Equivalent with 1.5 year of experience in relevant field) OR Completed 3 year diploma after 10th (in relevant field) OR Previous relevant Qualification of NSQF Level (3-Telecom Electrician (Basic)) with 3 Years of experience
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	NA
Next Review Date	31/01/2027
NSQC Approval Date	31/01/2024
Version	1.0
Reference code on NQR	QG-04-TL-01997-2024-V1-TSSC
NQR Version	1

TEL/N4301: Install and Maintain Inverter and Battery Banks

Description

This OS unit encompasses the process of installing and maintaining inverter and battery banks.

Scope

The scope covers the following :

- Inverter and Battery Banks
- Battery Technology

Elements and Performance Criteria

Inverter and Battery Banks

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

PC1. choose an inverter with the appropriate capacity for need

PC2. select compatible batteries that can handle the inverter's output capacity

PC3. turn off the main power supply to ensure safety while working on the installation

PC4. install the inverter in a well-ventilated, dry, and secure location, away from direct sunlight and extreme temperatures

PC5. ensure there is adequate space around the inverter for proper airflow and heat dissipation

PC6. connect the batteries in series or parallel, depending on your inverter's voltage requirements

PC7. connect the inverter to the battery bank using the provided cables, ensuring correct polarity

PC8. ground the inverter according to local electrical codes

PC9. power on the inverter and check for any warning lights or alarms

PC10. verify that the inverter is providing the desired output voltage and frequency

PC11. connect electrical loads to the inverter's output terminals

PC12. connect a charging source such as solar panels or a grid charger to keep the batteries charged

PC13. inspect the battery bank, inverter, and all connections for signs of wear, damage, or corrosion

PC14. tighten loose connections and replace damaged cables or connectors

PC15. monitor battery voltage and state of charge regularly

PC16. clean the battery terminals and apply anti-corrosion grease to prevent corrosion

PC17. check the water level in flooded lead-acid batteries and top up with distilled water as needed

PC18. check the cooling fans and clean or replace them if necessary

PC19. check for software updates from the manufacturer and install them as recommended

Battery Technology

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

PC20. make sure the correct type of battery is been used

PC21. insert the batteries with the correct polarity (+ and -) according to the markings

PC22. inspect batteries for any physical damage or leakage
PC23. clean battery terminals and cable connections to prevent corrosion
PC24. avoid deep discharges if possible, as they can shorten battery life
PC25. perform an equalization charge periodically
PC26. use a battery monitoring system to keep track of voltage, temperature, and other relevant parameters
PC27. plan for battery replacement based on the manufacturer's recommended service
PC28. avoid short circuits, overloads, and mishandling that could lead to accidents

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. factors like the load you want to power and the duration of backup required
KU2. manufacturer's guidelines for wiring
KU3. battery bank is for backup power
KU4. battery types include alkaline, lithium-ion, lead-acid, and nickel-cadmium
KU5. store batteries in a cool, dry place away from direct sunlight and extreme temperatures
KU6. Not to damaged batteries as they are dangerous to use
KU7. manufacturer's instructions for installing batteries
KU8. baking soda and water to neutralize any acid buildup in battery terminals, then rinse with clean water and dry thoroughly
KU9. heat or cold can degrade battery performance and lifespan
KU10. proper charging and discharging practices for the specific battery type
KU11. issues early and prevent problems
KU12. Proper disposal or recycling of old batteries is essential
KU13. safety precautions when working with batteries
KU14. maintenance activities, including inspections, charging/discharging cycles, and any issues encountered
KU15. Risk assessment and hazard identification in the workplace
KU16. safe work practices in telecom electrical maintenance and installations
KU17. electrical isolation and LOTO

Generic Skills (GS)

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

GS1. read and understand documents and other materials
GS2. interact respectfully with end users/customers
GS3. liaise with customers/vendors
GS4. communicate in the local language (preferable)
GS5. work in coordination with team

GS6. work systematically with attention to detail and adherence to all safety requirements

GS7. maintain proper records as per given format

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Inverter and Battery Banks	**25**	**30**	**-**	**6**
PC1. choose an inverter with the appropriate capacity for need	1	1	-	-
PC2. select compatible batteries that can handle the inverter's output capacity	2	3	-	1
PC3. turn off the main power supply to ensure safety while working on the installation	1	1	-	-
PC4. install the inverter in a well-ventilated, dry, and secure location, away from direct sunlight and extreme temperatures	1	2	-	-
PC5. ensure there is adequate space around the inverter for proper airflow and heat dissipation	2	1	-	-
PC6. connect the batteries in series or parallel, depending on your inverter's voltage requirements	3	1	-	-
PC7. connect the inverter to the battery bank using the provided cables, ensuring correct polarity	1	3	-	-
PC8. ground the inverter according to local electrical codes	1	3	-	-
PC9. power on the inverter and check for any warning lights or alarms	1	4	-	1
PC10. verify that the inverter is providing the desired output voltage and frequency	1	1	-	1
PC11. connect electrical loads to the inverter's output terminals	2	1	-	-
PC12. connect a charging source such as solar panels or a grid charger to keep the batteries charged	1	1	-	-
PC13. inspect the battery bank, inverter, and all connections for signs of wear, damage, or corrosion	1	1	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. tighten loose connections and replace damaged cables or connectors	1	1	-	-
PC15. monitor battery voltage and state of charge regularly	1	1	-	-
PC16. clean the battery terminals and apply anti-corrosion grease to prevent corrosion	1	1	-	1
PC17. check the water level in flooded lead-acid batteries and top up with distilled water as needed	2	1	-	-
PC18. check the cooling fans and clean or replace them if necessary	1	1	-	1
PC19. check for software updates from the manufacturer and install them as recommended	1	2	-	-
Battery Technology	**15**	**20**	**-**	**4**
PC20. make sure the correct type of battery is been used	1	2	-	-
PC21. insert the batteries with the correct polarity (+ and -) according to the markings	3	3	-	-
PC22. inspect batteries for any physical damage or leakage	2	1	-	1
PC23. clean battery terminals and cable connections to prevent corrosion	1	3	-	1
PC24. avoid deep discharges if possible, as they can shorten battery life	3	1	-	-
PC25. perform an equalization charge periodically	1	3	-	1
PC26. use a battery monitoring system to keep track of voltage, temperature, and other relevant parameters	1	3	-	-
PC27. plan for battery replacement based on the manufacturer's recommended service	1	2	-	-
PC28. avoid short circuits, overloads, and mishandling that could lead to accidents	2	2	-	1

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N4301
NOS Name	Install and Maintain Inverter and Battery Banks
Sector	Telecom
Sub-Sector	Passive Infrastructure
Occupation	Customer Service - Passive Infrastructure
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	31/01/2024
Next Review Date	31/01/2027
NSQC Clearance Date	31/01/2024

TEL/N4302: Design and Install One-Phase and Three-Phase Electrical Systems at cell site

Description

This OS unit involves designing and installing one-phase and three-phase electrical systems at cell site.

Scope

The scope covers the following :

- One-Phase Electrical System
- Three-Phase Electrical Systems

Elements and Performance Criteria

One-Phase Electrical Systems

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

PC1. identify the available power source and voltage level

PC2. calculate the total electrical load (in watts or VA) that the cell site will require

PC3. select the appropriate voltage level for the one-phase system, typically 120/240V in residential areas or 208/120V in commercial areas

PC4. design the grounding and bonding system to meet safety and code requirements

PC5. consult with local authorities and utility providers to obtain the necessary permits and approvals for the electrical installation

PC6. ensure that all equipment is compliant with safety standards and suitable for outdoor or harsh environmental conditions

PC7. ensure proper grounding of the electrical system to prevent electrical hazards

PC8. follow best practices for cable management, routing, and labelling

PC9. install surge protection devices and backup power systems if needed to ensure uninterrupted service

PC10. connect the cell site equipment, including base stations, antennas, and power distribution units (PDUs), to the electrical system

PC11. verify that the connections are secure and properly grounded

PC12. test the equipment to ensure it functions correctly

PC13. conduct electrical tests to verify voltage levels, grounding, and circuit continuity

PC14. use appropriate testing equipment, such as multimeters and ground resistance testers

PC15. ensure that all wiring connections are tight and free from defects

PC16. implement safety measures, such as installing safety labels and signage, to protect personnel working at the cell site

PC17. ensure that all electrical equipment is properly enclosed and secured to prevent unauthorized access

Three-Phase Electrical Systems

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

PC18. total electrical load requirements of the cell site, including the power needs of the radios, antennas, HVAC

PC19. specify the required voltage and frequency for the three-phase system based on the equipment's specifications and regional standards

PC20. create a single-line diagram that outlines the electrical system's components, including transformers, switchgear, distribution panels, and loads

PC21. select an appropriate transformer to step up or down voltage levels as needed and to provide isolation and safety

PC22. choose and size circuit breakers, fuses, and protective devices to ensure safe and reliable power distribution

PC23. design distribution panels and subpanels to distribute power to various loads, ensuring balanced phases and redundancy if necessary

PC24. install transformers, switchgear, distribution panels, and other electrical components following manufacturer guidelines and local codes

PC25. run and terminate electrical cables and conductors according to the single-line diagram and applicable standards

PC26. establish grounding systems for both safety and equipment protection

PC27. make secure and properly torqued electrical connections, and label all cables and conductors for easy identification

PC28. install circuit breakers, fuses, surge protectors, and other protection devices as specified in the design

PC29. conduct comprehensive testing of the electrical system, including continuity checks, insulation resistance tests, and functional tests

PC30. verify that the three phases are balanced to ensure even power distribution and prevent voltage fluctuations

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. basic electrical principles, including voltage, current, resistance, and power

KU2. Ohm's law (V equal to IR) and how it applies to electrical circuits

KU3. electrical load requirements of the cell site, including the equipment, lighting, and HVAC

KU4. electrical materials, including wires, circuit breakers, panels, junction boxes, and conduit

KU5. single-phase AC power systems, including the generation, distribution, and utilization of single-phase power

KU6. electrical safety procedures and guidelines to prevent electrical hazards and ensure personal safety

KU7. electrical circuits, including the selection of appropriate components like circuit breakers, fuses, wires, and outlets

KU8. how to calculate voltage drop in electrical circuits to ensure that equipment receives the required voltage

KU9. grounding and bonding principles to ensure electrical safety and equipment protection

KU10. installation of protective devices such as surge protectors, circuit breakers, and ground fault circuit interrupters (GFCIs)

KU11. wiring techniques, cable installation, and cable management to maintain neat and organized electrical connections

KU12. how to safely install cell site equipment, including power supplies, batteries, and backup generators

KU13. cable management

Generic Skills (GS)

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

GS1. write records as per given format

GS2. read and understand manuals, work orders, health and safety instructions, memos, reports etc.

GS3. interact respectfully with supervisor/peers

GS4. communicate in the local language with the customers

GS5. work efficiently and effectively

GS6. work systematically with required attention to detail and adherence to all safety requirements

GS7. maintain proper etiquette in front of the customers

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
One-Phase Electrical Systems	**24**	**30**	**-**	**7**
PC1. identify the available power source and voltage level	1	2	-	-
PC2. calculate the total electrical load (in watts or VA) that the cell site will require	1	3	-	-
PC3. select the appropriate voltage level for the one-phase system, typically 120/240V in residential areas or 208/120V in commercial areas	2	1	-	1
PC4. design the grounding and bonding system to meet safety and code requirements	1	1	-	1
PC5. consult with local authorities and utility providers to obtain the necessary permits and approvals for the electrical installation	2	1	-	1
PC6. ensure that all equipment is compliant with safety standards and suitable for outdoor or harsh environmental conditions	1	2	-	-
PC7. ensure proper grounding of the electrical system to prevent electrical hazards	3	2	-	1
PC8. follow best practices for cable management, routing, and labelling	1	1	-	-
PC9. install surge protection devices and backup power systems if needed to ensure uninterrupted service	1	1	-	-
PC10. connect the cell site equipment, including base stations, antennas, and power distribution units (PDUs), to the electrical system	1	3	-	1
PC11. verify that the connections are secure and properly grounded	2	1	-	-
PC12. test the equipment to ensure it functions correctly	1	1	-	-
PC13. conduct electrical tests to verify voltage levels, grounding, and circuit continuity	2	4	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. use appropriate testing equipment, such as multimeters and ground resistance testers	2	2	-	-
PC15. ensure that all wiring connections are tight and free from defects	1	1	-	-
PC16. implement safety measures, such as installing safety labels and signage, to protect personnel working at the cell site	1	1	-	1
PC17. ensure that all electrical equipment is properly enclosed and secured to prevent unauthorized access	1	3	-	-
Three-Phase Electrical Systems	**16**	**20**	**-**	**3**
PC18. total electrical load requirements of the cell site, including the power needs of the radios, antennas, HVAC	1	1	-	-
PC19. specify the required voltage and frequency for the three-phase system based on the equipment's specifications and regional standards	1	1	-	-
PC20. create a single-line diagram that outlines the electrical system's components, including transformers, switchgear, distribution panels, and loads	2	3	-	-
PC21. select an appropriate transformer to step up or down voltage levels as needed and to provide isolation and safety	1	1	-	-
PC22. choose and size circuit breakers, fuses, and protective devices to ensure safe and reliable power distribution	1	1	-	1
PC23. design distribution panels and subpanels to distribute power to various loads, ensuring balanced phases and redundancy if necessary	1	1	-	-
PC24. install transformers, switchgear, distribution panels, and other electrical components following manufacturer guidelines and local codes	1	1	-	-
PC25. run and terminate electrical cables and conductors according to the single-line diagram and applicable standards	2	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC26. establish grounding systems for both safety and equipment protection	1	3	-	1
PC27. make secure and properly torqued electrical connections, and label all cables and conductors for easy identification	1	4	-	-
PC28. install circuit breakers, fuses, surge protectors, and other protection devices as specified in the design	1	1	-	1
PC29. conduct comprehensive testing of the electrical system, including continuity checks, insulation resistance tests, and functional tests	1	1	-	-
PC30. verify that the three phases are balanced to ensure even power distribution and prevent voltage fluctuations	2	1	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N4302
NOS Name	Design and Install One-Phase and Three-Phase Electrical Systems at cell site
Sector	Telecom
Sub-Sector	Passive Infrastructure
Occupation	Customer Service - Passive Infrastructure
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	31/01/2024
Next Review Date	31/01/2027
NSQC Clearance Date	31/01/2024

TEL/N4303: Install, Maintain, and Troubleshoot Electrical Components

Description

This OS unit involves installing, maintaining, and troubleshooting electrical components.

Scope

The scope covers the following :

- Electrical Components in Telecom Systems
- Generators
- Air Conditioners

Elements and Performance Criteria

Electrical Components in Telecom Systems

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

PC1. gather the required tools and equipment, including multimeters, insulation resistance testers, cable testers, crimping tools, and soldering equipment

PC2. follow the installation guidelines provided by the telecom equipment manufacturer

PC3. disconnect power sources and lockout/tagout procedures before starting any work

PC4. Install power distribution equipment, backup power systems (e.g., batteries, generators), and grounding systems

PC5. mount and connect antennas and radio equipment

PC6. install surge protectors and lightning arrestors

PC7. connect power supplies, HVAC systems, and data cabling

PC8. set up the network operations center with proper electrical wiring and network infrastructure

PC9. install server racks, power distribution units (PDUs), and backup power systems

PC10. connect network switches, routers, and servers

PC11. inspect electrical components for signs of wear, damage, or corrosion

PC12. monitor backup power systems and replace batteries as needed

PC13. keep electrical components clean and free of dust, which can lead to overheating and malfunctions

PC14. use compressed air or specialized cleaning tools to remove dust and debris

PC15. schedule to replace or refurbish components before they fail

PC16. test backup power systems regularly to ensure they function during power outages

PC17. use diagnostic tools like multimeters, oscilloscopes, and network analyzers to identify issues

PC18. disconnect or isolate components to narrow down the source of the problem

PC19. repair or replace faulty electrical components, such as power supplies, circuit breakers, or damaged wiring

PC20. thoroughly test the system to ensure the issue is resolved

Generators

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

PC21. conduct a thorough site survey to determine the generator's placement, size requirements, fuel source, and environmental considerations

PC22. choose an appropriate generator based on power requirements, backup duration, and site-specific conditions (e.g., altitude, temperature, humidity)

PC23. ensure compliance with local permits, regulations, and safety standards for generator installation

PC24. construct a stable concrete foundation for the generator

PC25. securely mount the generator to prevent vibrations and reduce noise

PC26. establish a reliable fuel supply system, including fuel tanks, pipes, and safety mechanisms

PC27. connect the generator to the telecom system's electrical panel, ensuring proper grounding and wiring

PC28. conduct initial start-up and load testing to ensure the generator operates correctly and can handle the anticipated load

PC29. perform routine visual inspections of the generator, checking for leaks, loose connections, and signs of wear or damage

PC30. regularly change engine oil, fuel filters, and air filters according to the manufacturer's recommendations

PC31. monitor the cooling system, including coolant levels and radiator cleanliness

PC32. check and maintain the generator's batteries, including cleaning terminals and ensuring they are fully charged

PC33. monitor fuel levels, condition, and quality regularly

PC34. clean fuel tanks and replace fuel filters as needed

PC35. periodically test the generator under load conditions to ensure it can handle the telecom system's power demands

PC36. use diagnostic tools and software provided by the generator manufacturer to identify issues

PC37. monitor the generator's alarm system for any alerts or warnings and address them promptly

PC38. troubleshoot fuel delivery problems, such as clogs, leaks, or contaminated fuel

Air Conditioners

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

PC39. ensure that the installation location complies with safety and environmental regulations

PC40. select an air conditioner unit that meets the cooling capacity and efficiency requirements of the site

PC41. install the air conditioner unit securely on a level surface to prevent vibrations and damage

PC42. ensure proper ventilation and clearance for airflow around the unit

PC43. connect the air conditioner to a stable power source with the correct voltage and amperage

PC44. check for refrigerant leaks during installation

PC45. clean or replace air filters regularly to maintain airflow and efficiency

PC46. clean the evaporator and condenser coils to remove dirt and debris, which can reduce efficiency

PC47. lubricate moving parts, such as fan motors and bearings, as per the manufacturer's recommendations

PC48. monitor and adjust the temperature settings to maintain the desired operating conditions

PC49. regularly inspect electrical components for signs of overheating or damage

PC50. check the power supply and wiring for faults or loose connections

PC51. inspect and repair any mechanical components, like fans or compressors, that are not functioning correctly

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. electrical principles, including voltage, current, resistance, and power

KU2. electrical circuits and how they work

KU3. Cisco, CompTIA, or vendors like Huawei or Ericsson

KU4. location and requirements for the cell site or BTS installation

KU5. proper grounding and cooling systems

KU6. monitoring systems and logs to pinpoint problems

KU7. factors like ambient temperature, humidity, and altitude when choosing the unit

KU8. appropriate generator size and capacity based on the telecom site's power requirements and load calculations

KU9. factors like startup surge currents and load variations

KU10. critical nature of power supply in telecom systems and the need for generator redundancy

KU11. telecom-specific protocols and procedures for generator operation and maintenance

KU12. heating, ventilation, and air conditioning (HVAC) systems, including the components, refrigerants, and principles of operation

KU13. various types of air conditioning units commonly used in telecom systems, such as split systems, rooftop units, and precision air conditioners

KU14. proper installation of air conditioning units, including mounting, wiring, and ensuring adequate ventilation

KU15. local and national electrical codes and safety regulations to ensure compliance during installation and maintenance activities

KU16. refrigeration cycles, components (compressors, evaporators, condensers), and refrigerants com

KU17. electrical and mechanical problems in air conditioning units, including issues with motors, capacitors, relays, and refrigerant leaks

KU18. air conditioning units operate efficiently and minimize downtime

KU19. environmental regulations related to refrigerant handling and disposal

KU20. respond to emergencies, such as power failures, equipment malfunctions, or environmental hazards, to ensure the uninterrupted operation of telecom systems

Generic Skills (GS)

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

GS1. read manuals, work orders, health and safety instructions, etc.

GS2. fill up appropriate technical forms and activity logs in required format of the organisation

GS3. maintain proper records as per prescribed format

GS4. communicate with supervisor and peers

GS5. communicate in the local language (preferably)

GS6. prioritize and execute tasks in a high-pressure environment and handle high pressure situations

GS7. handle multiple tasks and complete them successfully within timelines

GS8. use resources efficiently and effectively

GS9. maintain effective working relationships and team environment

GS10. share knowledge with other team members and colleagues

GS11. utilize appropriate communication channels to escalate unresolved problems to relevant personnel

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Electrical Components in Telecom Systems	**15**	**20**	**-**	**4**
PC1. gather the required tools and equipment, including multimeters, insulation resistance testers, cable testers, crimping tools, and soldering equipment	-	1	-	-
PC2. follow the installation guidelines provided by the telecom equipment manufacturer	1	1	-	-
PC3. disconnect power sources and lockout/tagout procedures before starting any work	1	1	-	-
PC4. Install power distribution equipment, backup power systems (e.g., batteries, generators), and grounding systems	1	1	-	1
PC5. mount and connect antennas and radio equipment	1	1	-	-
PC6. install surge protectors and lightning arrestors	1	1	-	-
PC7. connect power supplies, HVAC systems, and data cabling	1	1	-	-
PC8. set up the network operations center with proper electrical wiring and network infrastructure	1	1	-	-
PC9. install server racks, power distribution units (PDUs), and backup power systems	1	1	-	1
PC10. connect network switches, routers, and servers	1	1	-	1
PC11. inspect electrical components for signs of wear, damage, or corrosion	1	1	-	-
PC12. monitor backup power systems and replace batteries as needed	1	1	-	-
PC13. keep electrical components clean and free of dust, which can lead to overheating and malfunctions	-	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. use compressed air or specialized cleaning tools to remove dust and debris	-	1	-	-
PC15. schedule to replace or refurbish components before they fail	-	1	-	-
PC16. test backup power systems regularly to ensure they function during power outages	-	1	-	1
PC17. use diagnostic tools like multimeters, oscilloscopes, and network analyzers to identify issues	1	1	-	-
PC18. disconnect or isolate components to narrow down the source of the problem	1	1	-	-
PC19. repair or replace faulty electrical components, such as power supplies, circuit breakers, or damaged wiring	1	1	-	-
PC20. thoroughly test the system to ensure the issue is resolved	1	1	-	-
Generators	**15**	**19**	**-**	**3**
PC21. conduct a thorough site survey to determine the generator's placement, size requirements, fuel source, and environmental considerations	-	1	-	-
PC22. choose an appropriate generator based on power requirements, backup duration, and site-specific conditions (e.g., altitude, temperature, humidity)	1	2	-	-
PC23. ensure compliance with local permits, regulations, and safety standards for generator installation	1	1	-	-
PC24. construct a stable concrete foundation for the generator	1	2	-	-
PC25. securely mount the generator to prevent vibrations and reduce noise	1	1	-	1
PC26. establish a reliable fuel supply system, including fuel tanks, pipes, and safety mechanisms	1	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC27. connect the generator to the telecom system's electrical panel, ensuring proper grounding and wiring	1	1	-	-
PC28. conduct initial start-up and load testing to ensure the generator operates correctly and can handle the anticipated load	1	1	-	-
PC29. perform routine visual inspections of the generator, checking for leaks, loose connections, and signs of wear or damage	1	1	-	-
PC30. regularly change engine oil, fuel filters, and air filters according to the manufacturer's recommendations	1	1	-	-
PC31. monitor the cooling system, including coolant levels and radiator cleanliness	1	1	-	1
PC32. check and maintain the generator's batteries, including cleaning terminals and ensuring they are fully charged	1	1	-	-
PC33. monitor fuel levels, condition, and quality regularly	1	1	-	-
PC34. clean fuel tanks and replace fuel filters as needed	1	1	-	-
PC35. periodically test the generator under load conditions to ensure it can handle the telecom system's power demands	1	1	-	-
PC36. use diagnostic tools and software provided by the generator manufacturer to identify issues	-	-	-	1
PC37. monitor the generator's alarm system for any alerts or warnings and address them promptly	-	1	-	-
PC38. troubleshoot fuel delivery problems, such as clogs, leaks, or contaminated fuel	1	-	-	-
Air Conditioners	**10**	**11**	**-**	**3**
PC39. ensure that the installation location complies with safety and environmental regulations	1	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC40. select an air conditioner unit that meets the cooling capacity and efficiency requirements of the site	1	1	-	-
PC41. install the air conditioner unit securely on a level surface to prevent vibrations and damage	1	1	-	-
PC42. ensure proper ventilation and clearance for airflow around the unit	1	1	-	-
PC43. connect the air conditioner to a stable power source with the correct voltage and amperage	1	1	-	1
PC44. check for refrigerant leaks during installation	1	1	-	-
PC45. clean or replace air filters regularly to maintain airflow and efficiency	1	-	-	-
PC46. clean the evaporator and condenser coils to remove dirt and debris, which can reduce efficiency	1	1	-	-
PC47. lubricate moving parts, such as fan motors and bearings, as per the manufacturer's recommendations	1	1	-	1
PC48. monitor and adjust the temperature settings to maintain the desired operating conditions	1	1	-	1
PC49. regularly inspect electrical components for signs of overheating or damage	-	1	-	-
PC50. check the power supply and wiring for faults or loose connections	-	1	-	-
PC51. inspect and repair any mechanical components, like fans or compressors, that are not functioning correctly	-	1	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N4303
NOS Name	Install, Maintain, and Troubleshoot Electrical Components
Sector	Telecom
Sub-Sector	Passive Infrastructure
Occupation	Customer Service - Passive Infrastructure
NSQF Level	4
Credits	3
Version	1.0
Last Reviewed Date	31/01/2024
Next Review Date	31/01/2027
NSQC Clearance Date	31/01/2024

TEL/N4304: Upgrade electrical systems to meet capacity and power quality requirements

Description

This OS unit is about upgrading electrical systems to meet capacity and power quality requirements.

Scope

The scope covers the following :

- Electrical Distribution Systems and Power Quality
- Electrical Testing and Troubleshooting
- Electrical Maintenance and Upgrade

Elements and Performance Criteria

Electrical Distribution Systems and Power Quality

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

PC1. understand the existing electrical infrastructure, power requirements, and power quality issues

PC2. determine the specific power requirements of the site, considering the number of telecom equipment racks, air conditioning units, lighting, and any other electrical loads

PC3. conduct power quality analysis to identify and address issues such as voltage fluctuations, harmonics, voltage sags, and surges

PC4. use power quality monitoring equipment to collect data

PC5. balance the electrical loads to ensure even distribution of power among phases to prevent overloading and voltage imbalances

PC6. assess the capacity of the existing electrical distribution system to handle the increased load

PC7. upgrade the electrical distribution system

PC8. replacing or upgrading transformers, circuit breakers, switchgear, and distribution panels

PC9. adding additional electrical circuits and outlets to accommodate new equipment

PC10. install backup power solutions such as uninterruptible power supplies (UPS) or backup generators to ensure uninterrupted operation during power outages or fluctuations

PC11. install surge protection devices to safeguard sensitive telecom equipment from voltage spikes and surges

PC12. implement power factor correction equipment to improve power factor and reduce reactive power charges

PC13. ensure proper grounding and bonding of electrical equipment to mitigate the risk of electrical faults and improve safety

PC14. implement voltage regulation equipment to maintain stable voltage levels within the desired range, especially in areas with frequent voltage fluctuations

PC15. establish a regular maintenance schedule to inspect and maintain electrical distribution equipment

PC16. continuously monitor power quality and equipment performance to proactively address issues

PC17. ensure that all electrical upgrades and installations comply with local electrical codes, industry standards, and safety regulations

PC18. consider redundant power sources and distribution paths to enhance system reliability and minimize downtime

Electrical Testing and Troubleshooting

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

PC19. develop a strong foundation in electrical principles, including voltage, current, resistance, and power calculations

PC20. read and interpret electrical diagrams and schematics to understand the wiring and connections in cell sites, BTS, NOS, and related equipment

PC21. operate a wide range of electrical testing instruments, such as multimeters, oscilloscopes, clamp meters, and power analyzers

PC22. accurately measure voltage and current levels to assess the health of electrical circuits and components

PC23. recognize common electrical faults, such as short circuits, open circuits, and ground faults, through systematic testing and analysis

PC24. effectively troubleshoot and isolate electrical problems in telecom systems to minimize downtime

PC25. assess power quality parameters, including voltage stability, harmonics, and transient voltage surges, using appropriate monitoring and testing equipment

PC26. implement corrective actions to address electrical issues, including repairing or replacing faulty components and conducting preventive maintenance

PC27. generate comprehensive power quality reports to identify areas for improvement and optimize the performance of cell site, BTS, and NOS equipment

Electrical Maintenance and Upgrade

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

PC28. perform detailed electrical and power quality assessments for cell sites, BTS, NOS, and other sectors to identify potential issues, capacity constraints, and areas for improvement

PC29. analyze the current and future load requirements of the telecom systems to determine if existing electrical infrastructure is sufficient or if upgrades are needed

PC30. develop upgrade plans that include selecting appropriate electrical components (circuit breakers, transformers, wiring, etc.) and coordinating the installation of new equipment to meet increased power demands

PC31. utilize power quality monitoring tools and equipment to assess voltage levels, harmonics, frequency variations, and other electrical parameters affecting the stability of the power supply

PC32. identify and rectify voltage fluctuations and sags that can disrupt the operation of telecom equipment by installing voltage stabilizers or regulators

PC33. install surge protectors and lightning arrestors to safeguard telecom systems from transient voltage spikes and lightning strikes

PC34. continuously monitor and maintain proper grounding systems to minimize the risk of electrical faults and ensure personnel safety

PC35. assess the reliability of backup power systems (e.g., generators, uninterruptible power supplies) and make necessary upgrades to ensure seamless operation during power outages

PC36. identify opportunities to improve energy efficiency, such as optimizing cooling systems, and implementing energy-saving technologies like LED lighting

PC37. design electrical systems with scalability in mind to accommodate future growth and technology advancements

PC38. develop and adhere to a schedule for routine electrical maintenance tasks, including cleaning, tightening connections, and lubricating moving parts

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. electrical systems, including wiring, distribution panels, circuit breakers, transformers, and generators commonly used in telecom facilities

KU2. power quality assessments using monitoring equipment to evaluate voltage stability, harmonics, frequency variations, and disturbances

KU3. electrical load requirements to determine the capacity needed for current and future telecom equipment

KU4. surge protection devices and strategies to safeguard telecom systems from voltage spikes and lightning-induced surges

KU5. backup power systems, such as generators, uninterruptible power supplies (UPS), and batteries, including their installation and maintenance

KU6. grounding and bonding systems to minimize electrical faults and ensure safety

KU7. energy-saving practices and technologies to reduce power consumption and operational costs

KU8. electrical issues, including identifying faulty components, loose connections, and voltage irregularities

KU9. telecom equipment specifications and power requirements to ensure compatibility with the electrical infrastructure

KU10. power distribution principles and practices, including load balancing and distribution panel design

KU11. electrical drawings, schematics, and blueprints to plan and execute upgrades accurately

KU12. short circuits, overloads, and voltage fluctuations

KU13. electrical testing equipment such as multimeters, insulation testers, and thermal imaging cameras to assess the condition of electrical components

KU14. backup power systems (e.g., generators, UPS systems) and their integration into the electrical infrastructure for uninterrupted service

KU15. proper grounding and bonding techniques to ensure electrical safety and equipment protection

KU16. predictive maintenance practices for electrical systems, including cleaning, lubrication, and equipment inspections

Generic Skills (GS)

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

GS1. communicate respectfully with customer/customer facing teams
GS2. read and understand documents and reports
GS3. speak and understand English/regional language
GS4. read and write in English or any regional language
GS5. manage time efficiently
GS6. listen carefully and respond appropriately
GS7. work systematically with attention to detail

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Electrical Distribution Systems and Power Quality	**15**	**20**	**-**	**3**
PC1. understand the existing electrical infrastructure, power requirements, and power quality issues	1	2	-	-
PC2. determine the specific power requirements of the site, considering the number of telecom equipment racks, air conditioning units, lighting, and any other electrical loads	1	1	-	-
PC3. conduct power quality analysis to identify and address issues such as voltage fluctuations, harmonics, voltage sags, and surges	1	2	-	-
PC4. use power quality monitoring equipment to collect data	1	1	-	-
PC5. balance the electrical loads to ensure even distribution of power among phases to prevent overloading and voltage imbalances	1	1	-	1
PC6. assess the capacity of the existing electrical distribution system to handle the increased load	1	1	-	-
PC7. upgrade the electrical distribution system	-	1	-	-
PC8. replacing or upgrading transformers, circuit breakers, switchgear, and distribution panels	-	1	-	-
PC9. adding additional electrical circuits and outlets to accommodate new equipment	-	1	-	-
PC10. install backup power solutions such as uninterruptible power supplies (UPS) or backup generators to ensure uninterrupted operation during power outages or fluctuations	1	1	-	-
PC11. install surge protection devices to safeguard sensitive telecom equipment from voltage spikes and surges	1	1	-	-
PC12. implement power factor correction equipment to improve power factor and reduce reactive power charges	1	1	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. ensure proper grounding and bonding of electrical equipment to mitigate the risk of electrical faults and improve safety	1	1	-	-
PC14. implement voltage regulation equipment to maintain stable voltage levels within the desired range, especially in areas with frequent voltage fluctuations	1	1	-	-
PC15. establish a regular maintenance schedule to inspect and maintain electrical distribution equipment	1	1	-	1
PC16. continuously monitor power quality and equipment performance to proactively address issues	1	1	-	-
PC17. ensure that all electrical upgrades and installations comply with local electrical codes, industry standards, and safety regulations	1	1	-	-
PC18. consider redundant power sources and distribution paths to enhance system reliability and minimize downtime	1	1	-	-
Electrical Testing and Troubleshooting	**10**	**20**	**-**	**3**
PC19. develop a strong foundation in electrical principles, including voltage, current, resistance, and power calculations	1	3	-	-
PC20. read and interpret electrical diagrams and schematics to understand the wiring and connections in cell sites, BTS, NOS, and related equipment	1	2	-	-
PC21. operate a wide range of electrical testing instruments, such as multimeters, oscilloscopes, clamp meters, and power analyzers	1	2	-	-
PC22. accurately measure voltage and current levels to assess the health of electrical circuits and components	2	2	-	1
PC23. recognize common electrical faults, such as short circuits, open circuits, and ground faults, through systematic testing and analysis	1	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC24. effectively troubleshoot and isolate electrical problems in telecom systems to minimize downtime	1	1	-	-
PC25. assess power quality parameters, including voltage stability, harmonics, and transient voltage surges, using appropriate monitoring and testing equipment	1	3	-	-
PC26. implement corrective actions to address electrical issues, including repairing or replacing faulty components and conducting preventive maintenance	1	3	-	1
PC27. generate comprehensive power quality reports to identify areas for improvement and optimize the performance of cell site, BTS, and NOS equipment	1	2	-	-
Electrical Maintenance and Upgrade	**15**	**10**	**-**	**4**
PC28. perform detailed electrical and power quality assessments for cell sites, BTS, NOS, and other sectors to identify potential issues, capacity constraints, and areas for improvement	1	1	-	-
PC29. analyze the current and future load requirements of the telecom systems to determine if existing electrical infrastructure is sufficient or if upgrades are needed	1	-	-	-
PC30. develop upgrade plans that include selecting appropriate electrical components (circuit breakers, transformers, wiring, etc.) and coordinating the installation of new equipment to meet increased power demands	1	1	-	-
PC31. utilize power quality monitoring tools and equipment to assess voltage levels, harmonics, frequency variations, and other electrical parameters affecting the stability of the power supply	1	1	-	1
PC32. identify and rectify voltage fluctuations and sags that can disrupt the operation of telecom equipment by installing voltage stabilizers or regulators	1	1	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC33. install surge protectors and lightning arrestors to safeguard telecom systems from transient voltage spikes and lightning strikes	1	1	-	-
PC34. continuously monitor and maintain proper grounding systems to minimize the risk of electrical faults and ensure personnel safety	1	1	-	-
PC35. assess the reliability of backup power systems (e.g., generators, uninterruptible power supplies) and make necessary upgrades to ensure seamless operation during power outages	2	1	-	-
PC36. identify opportunities to improve energy efficiency, such as optimizing cooling systems, and implementing energy-saving technologies like LED lighting	2	1	-	1
PC37. design electrical systems with scalability in mind to accommodate future growth and technology advancements	2	1	-	1
PC38. develop and adhere to a schedule for routine electrical maintenance tasks, including cleaning, tightening connections, and lubricating moving parts	2	1	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N4304
NOS Name	Upgrade electrical systems to meet capacity and power quality requirements
Sector	Telecom
Sub-Sector	Passive Infrastructure
Occupation	Customer Service - Passive Infrastructure
NSQF Level	4
Credits	3
Version	1.0
Last Reviewed Date	31/01/2024
Next Review Date	31/01/2027
NSQC Clearance Date	31/01/2024

TEL/N4305: Develop and implement telecom electrical standards

Description

This OS unit is about developing and implementing telecom electrical standards

Scope

The scope covers the following :

- Electrical Protection Systems
- Network Infrastructure and Cable Installation

Elements and Performance Criteria

Electrical Protection Systems

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

PC1. identify potential electrical hazards and conducting thorough risk assessments to determine the level of protection required

PC2. stay up-to-date with relevant electrical codes and standards (e.g., NEC, IEC) to ensure compliance and safety in the design and implementation of protection systems

PC3. choose the right protective devices, such as circuit breakers, fuses, relays, and surge protectors, based on the specific needs of the electrical system and its components

PC4. configure protection settings, including current and voltage levels, time delays, and coordination with upstream and downstream devices to ensure proper fault isolation

PC5. establish effective grounding and bonding systems to reduce the risk of electrical faults and to protect against electrical shock hazards

PC6. incorporate redundancy in protection systems to enhance reliability and minimize downtime in case of a fault or failure

PC7. divide the electrical system into protection zones and design protective devices and schemes for each zone, considering critical equipment and personnel safety

PC8. perform arc flash hazard analysis to assess the potential energy release in the event of a fault and design protective measures accordingly

PC9. configure protective relays to detect abnormal conditions and trip circuit breakers or initiate other protective actions when necessary

PC10. implement various fault detection methods, including overcurrent, differential, and ground fault protection, as appropriate to the system

PC11. incorporate remote monitoring and control capabilities to assess system health, receive alarms, and remotely operate protective devices

PC12. maintain accurate documentation of protection schemes, settings, and equipment layouts, and ensure clear labeling of protective devices and zones

PC13. thoroughly test and commission protection systems to validate their proper operation under normal and fault conditions

PC14. develop and implement a regular maintenance plan, including periodic testing and inspection of protective devices to ensure ongoing reliability

PC15. continuously assess and improve protection systems based on evolving technology, system changes, and lessons learned from past incidents

PC16. ensure that all protection systems comply with local, national, and international regulations and standards

PC17. establish comprehensive emergency response plans to address electrical faults and coordinate actions to minimize downtime and safety risks

Network Infrastructure and Cable Installation

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

PC18. evaluate the specific needs of the network infrastructure, including bandwidth, scalability, and connectivity requirements, to determine the scope of the installation project

PC19. create a detailed network topology design, including the placement of routers, switches, access points, and cable routes, to ensure optimal performance and reliability

PC20. choose the appropriate networking hardware, including routers, switches, access points, and cables, based on the network design and budget constraints

PC21. develop a cable routing plan that considers factors such as cable length, signal integrity, cable type (e.g., Ethernet, fiber optic), and cable management

PC22. prepare the installation site by ensuring adequate power supply, environmental controls, and physical security measures

PC23. install and terminate network cables, connectors, and jacks, following industry standards and best practices for cable management and labelling

PC24. conduct testing and certification of installed cables to verify proper functionality, signal quality, and compliance with performance standards (e.g., Ethernet cable testing)

PC25. configure network devices, such as routers and switches, to optimize network performance and security based on the design specifications

PC26. implement security measures, including firewalls, intrusion detection systems, and access controls, to protect the network infrastructure from cyber threats

PC27. maintain comprehensive documentation of the network installation, including cable maps, device configurations, and test results, for future reference and troubleshooting

PC28. ensure that the network installation complies with relevant industry standards, codes, and regulations, including data privacy and security regulations

PC29. develop troubleshooting skills to identify and resolve network issues promptly, minimizing downtime and disruptions

PC30. develop contingency plans and procedures to respond to network emergencies, such as equipment failures or security breaches

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. electrical systems, including generators, transformers, circuit breakers, and power distribution systems, to design effective protection systems

KU2. local and national electrical codes, regulations, and industry standards governing electrical protection systems

KU3. electrical safety protocols, including lockout/tagout procedures, personal protective equipment (PPE) use, and arc flash safety

KU4. risk assessments to identify potential electrical hazards and determine the appropriate level of protection required

KU5. protection devices, such as surge protectors, circuit breakers, relays, and fuses, and the criteria for selecting and sizing them

KU6. electrical faults, short circuits, overloads, and ground faults to design protection systems that can detect and mitigate these issues

KU7. operation of protection devices to ensure selective tripping or disconnecting of faulty circuits while maintaining power to critical equipment

KU8. surge protection measures to safeguard electrical systems from voltage spikes, surges, and transient disturbances

KU9. ground-fault protection systems to detect and isolate ground faults quickly, preventing electrical shock hazards

KU10. fault detection and protection methods to mitigate the risk of electrical fires

KU11. overcurrent protection, including the selection and coordination of circuit breakers and fuses to prevent equipment damage

KU12. emergency shutdown procedures to safely disconnect power during critical situations

KU13. remote monitoring and alarming systems to provide real-time alerts and notifications of potential electrical issues

KU14. electrical protection systems with control and automation systems to enable intelligent and automated responses to faults

KU15. regular testing and maintenance of protection systems to ensure they remain operational and effective

KU16. documentation of protection system designs, installation records, test results, and maintenance activities

KU17. regulatory requirements and standards specific to electrical protection systems in various industries and regions

Generic Skills (GS)

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

GS1. maintain proper records as per given format

GS2. read and comprehend technical manual and literature

GS3. read and understand work orders, health and safety instructions, memos, reports etc

GS4. communicate with supervisor and fellow technicians

GS5. communicate in the local language with the customers

GS6. maintain proper etiquette in front of the customers

GS7. work with minimum disturbance

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Electrical Protection Systems	**20**	**25**	**-**	**4**
PC1. identify potential electrical hazards and conducting thorough risk assessments to determine the level of protection required	1	2	-	-
PC2. stay up-to-date with relevant electrical codes and standards (e.g., NEC, IEC) to ensure compliance and safety in the design and implementation of protection systems	1	2	-	1
PC3. choose the right protective devices, such as circuit breakers, fuses, relays, and surge protectors, based on the specific needs of the electrical system and its components	2	1	-	1
PC4. configure protection settings, including current and voltage levels, time delays, and coordination with upstream and downstream devices to ensure proper fault isolation	1	1	-	-
PC5. establish effective grounding and bonding systems to reduce the risk of electrical faults and to protect against electrical shock hazards	1	2	-	-
PC6. incorporate redundancy in protection systems to enhance reliability and minimize downtime in case of a fault or failure	1	1	-	-
PC7. divide the electrical system into protection zones and design protective devices and schemes for each zone, considering critical equipment and personnel safety	1	2	-	-
PC8. perform arc flash hazard analysis to assess the potential energy release in the event of a fault and design protective measures accordingly	1	1	-	-
PC9. configure protective relays to detect abnormal conditions and trip circuit breakers or initiate other protective actions when necessary	2	2	-	-
PC10. implement various fault detection methods, including overcurrent, differential, and ground fault protection, as appropriate to the system	1	1	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. incorporate remote monitoring and control capabilities to assess system health, receive alarms, and remotely operate protective devices	1	2	-	-
PC12. maintain accurate documentation of protection schemes, settings, and equipment layouts, and ensure clear labeling of protective devices and zones	2	2	-	-
PC13. thoroughly test and commission protection systems to validate their proper operation under normal and fault conditions	1	2	-	-
PC14. develop and implement a regular maintenance plan, including periodic testing and inspection of protective devices to ensure ongoing reliability	1	1	-	1
PC15. continuously assess and improve protection systems based on evolving technology, system changes, and lessons learned from past incidents	1	1	-	-
PC16. ensure that all protection systems comply with local, national, and international regulations and standards	1	1	-	-
PC17. establish comprehensive emergency response plans to address electrical faults and coordinate actions to minimize downtime and safety risks	1	1	-	-
Network Infrastructure and Cable Installation	**20**	**25**	**-**	**6**
PC18. evaluate the specific needs of the network infrastructure, including bandwidth, scalability, and connectivity requirements, to determine the scope of the installation project	2	3	-	1
PC19. create a detailed network topology design, including the placement of routers, switches, access points, and cable routes, to ensure optimal performance and reliability	1	1	-	1
PC20. choose the appropriate networking hardware, including routers, switches, access points, and cables, based on the network design and budget constraints	2	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC21. develop a cable routing plan that considers factors such as cable length, signal integrity, cable type (e.g., Ethernet, fiber optic), and cable management	2	2	-	-
PC22. prepare the installation site by ensuring adequate power supply, environmental controls, and physical security measures	2	3	-	1
PC23. install and terminate network cables, connectors, and jacks, following industry standards and best practices for cable management and labelling	2	1	-	1
PC24. conduct testing and certification of installed cables to verify proper functionality, signal quality, and compliance with performance standards (e.g., Ethernet cable testing)	2	1	-	-
PC25. configure network devices, such as routers and switches, to optimize network performance and security based on the design specifications	2	2	-	1
PC26. implement security measures, including firewalls, intrusion detection systems, and access controls, to protect the network infrastructure from cyber threats	1	2	-	-
PC27. maintain comprehensive documentation of the network installation, including cable maps, device configurations, and test results, for future reference and troubleshooting	1	2	-	1
PC28. ensure that the network installation complies with relevant industry standards, codes, and regulations, including data privacy and security regulations	1	2	-	-
PC29. develop troubleshooting skills to identify and resolve network issues promptly, minimizing downtime and disruptions	1	2	-	-
PC30. develop contingency plans and procedures to respond to network emergencies, such as equipment failures or security breaches	1	2	-	-
NOS Total	**40**	**50**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N4305
NOS Name	Develop and implement telecom electrical standards
Sector	Telecom
Sub-Sector	Passive Infrastructure
Occupation	Customer Service - Passive Infrastructure
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	31/01/2024
Next Review Date	31/01/2027
NSQC Clearance Date	31/01/2024

TEL/N9101: Organize Work and Resources as per Health and Safety Standards

Description

This OS unit is about planning work and following sustainable as well as healthy practices for safety and optimal use of resources.

Scope

The scope covers the following :

- Perform work as per quality standards
- Maintain safe, healthy and secure working environment
- Conserve material/energy/electricity
- Use effective waste management/recycling practices

Elements and Performance Criteria

Perform work as per quality standards

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

PC1. keep workspace clean and tidy

PC2. perform individual role and responsibilities as per the job role while taking accountability for the work

PC3. record/document tasks completed as per the requirements within specific timelines

PC4. implement schedules to ensure timely completion of tasks

PC5. identify the cause of a problem related to own work and validate it

PC6. analyse problems accurately and communicate different possible solutions to the problem

Maintain safe, healthy and secure working environment

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

PC7. comply with organisation’s current health, safety, security policies and procedures

PC8. check for water spills in and around the work space and escalate these to the appropriate authority

PC9. report any identified breaches in health, safety, and security policies and procedures to the designated person

PC10. use safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.

PC11. avoid damage of components due to negligence in ESD procedures or any other loss due to safety negligence

PC12. identify hazards such as illness, accidents, fires or any other natural calamity safely, as per organisation's emergency procedures, within the limits of individual’s authority

PC13. participate regularly in fire drills or other safety related workshops organised by the company

PC14. report any hazard outside the individual’s authority to the relevant person in line with organisational procedures and warn others who may be affected

PC15. maintain appropriate posture while sitting/standing for long hours

PC16. handle heavy and hazardous materials with care, while maintaining appropriate posture

PC17. sanitize workstation and equipment regularly

PC18. clean hands with soap, alcohol-based sanitizer regularly

PC19. avoid contact with anyone suffering from communicable diseases and take necessary precautions

PC20. take safety precautions while travelling e.g. maintain 1m distance from others, sanitize hands regularly, wear masks, etc.

PC21. report hygiene and sanitation issues to appropriate authority

PC22. follow recommended personal hygiene and sanitation practices, for example, washing/sanitizing hands, covering face with a bent elbow while coughing/sneezing, using PPE, etc.

Conserve material/energy/electricity

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

PC23. optimize usage of material including water in various tasks/activities/processes

PC24. use resources such as water, electricity and others responsibly

PC25. carry out routine cleaning of tools, machine and equipment

PC26. optimize use of electricity/energy in various tasks/activities/processes

PC27. perform periodic checks of the functioning of the equipment/machine and rectify wherever required

PC28. report malfunctioning and lapses in maintenance of equipment

PC29. use electrical equipment and appliances properly

Use effective waste management/recycling practices

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

PC30. identify recyclable, non-recyclable and hazardous waste

PC31. deposit recyclable and reusable material at identified location

PC32. dispose non-recyclable and hazardous waste as per recommended processes

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. strategies pertinent to their field (such as internet searches, asking peers and managers, enrolling for courses and certifications, etc.) that can be used to pursue an advancement in their skills

KU2. key performance indicators for the new tasks

KU3. feedback processes and formats

KU4. timelines and goals as well as their relevance to work allocated

KU5. importance of quality and timely delivery of the product/service

KU6. escalation matrix and its importance, especially in case of emergencies

KU7. ways of time and cost management

KU8. rules/regulation for maintaining health and safety at workplace

KU9. meaning of hazard, different types of health and safety hazards found in the workplace, risks and threats based on the nature of work

KU10. relevant signage, warnings, labels or descriptions on equipment, etc. while carrying out work activities

KU11. procedures to report breaches in health, safety and security

KU12. organisation's procedures for different emergency situations and the importance of following the same

KU13. different methods of cleaning, disinfection, sterilization, and sanitization

KU14. significance of personal hygiene practice including hand hygiene

KU15. path of disease transmission

KU16. correct method of donning and doffing of PPE

KU17. ways of managing resources and material efficiently

KU18. common electrical problems and common practices of conserving electricity

KU19. categorization of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics and use of different colours of dustbins

KU20. organisation's procedures for minimizing waste

KU21. waste management and methods of waste disposal

KU22. common sources of pollution and ways to minimize it

Generic Skills (GS)

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

GS1. improve and modify work practices

GS2. complete tasks efficiently and accurately within stipulated time

GS3. develop skills and mastery of the technologies prevalent in the industry

GS4. write in at least one language and complete written work with attention to detail

GS5. utilize time and manage workload efficiently

GS6. read and comprehend instructions and documents

GS7. accept feedback in a constructive way

GS8. seek clarifications from superior about the job requirement

GS9. read and comprehend statutory documents relevant to safety and hygiene

GS10. refer all anomalies to the concerned persons

GS11. analyze situations and make appropriate decisions

GS12. decide the most suitable course of action for completing the task within resources

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform work as per quality standards	**4**	**9**	**-**	**2**
PC1. keep workspace clean and tidy	-	1	-	-
PC2. perform individual role and responsibilities as per the job role while taking accountability for the work	1	1	-	1
PC3. record/document tasks completed as per the requirements within specific timelines	-	1	-	1
PC4. implement schedules to ensure timely completion of tasks	-	2	-	-
PC5. identify the cause of a problem related to own work and validate it	2	2	-	-
PC6. analyse problems accurately and communicate different possible solutions to the problem	1	2	-	-
Maintain safe, healthy and secure working environment	**16**	**27**	**-**	**4**
PC7. comply with organisation's current health, safety, security policies and procedures	1	1	-	-
PC8. check for water spills in and around the work space and escalate these to the appropriate authority	1	2	-	1
PC9. report any identified breaches in health, safety, and security policies and procedures to the designated person	1	2	-	1
PC10. use safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.	1	2	-	1
PC11. avoid damage of components due to negligence in ESD procedures or any other loss due to safety negligence	2	3	-	1
PC12. identify hazards such as illness, accidents, fires or any other natural calamity safely, as per organisation's emergency procedures, within the limits of individual's authority	2	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. participate regularly in fire drills or other safety related workshops organised by the company	1	3	-	-
PC14. report any hazard outside the individual's authority to the relevant person in line with organisational procedures and warn others who may be affected	1	3	-	-
PC15. maintain appropriate posture while sitting/standing for long hours	1	1	-	-
PC16. handle heavy and hazardous materials with care, while maintaining appropriate posture	1	1	-	-
PC17. sanitize workstation and equipment regularly	1	2	-	-
PC18. clean hands with soap, alcohol-based sanitizer regularly	-	1	-	-
PC19. avoid contact with anyone suffering from communicable diseases and take necessary precautions	-	1	-	-
PC20. take safety precautions while travelling e.g. maintain 1m distance from others, sanitize hands regularly, wear masks, etc.	1	2	-	-
PC21. report hygiene and sanitation issues to appropriate authority	1	1	-	-
PC22. follow recommended personal hygiene and sanitation practices, for example, washing/sanitizing hands, covering face with a bent elbow while coughing/sneezing, using PPE, etc.	1	1	-	-
Conserve material/energy/electricity	**7**	**16**	**-**	**3**
PC23. optimize usage of material including water in various tasks/activities/processes	1	2	-	-
PC24. use resources such as water, electricity and others responsibly	1	2	-	1
PC25. carry out routine cleaning of tools, machine and equipment	1	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC26. optimize use of electricity/energy in various tasks/activities/processes	1	3	-	1
PC27. perform periodic checks of the functioning of the equipment/machine and rectify wherever required	1	3	-	1
PC28. report malfunctioning and lapses in maintenance of equipment	1	2	-	-
PC29. use electrical equipment and appliances properly	1	2	-	-
Use effective waste management/recycling practices	**3**	**8**	**-**	**1**
PC30. identify recyclable, non-recyclable and hazardous waste	1	2	-	1
PC31. deposit recyclable and reusable material at identified location	1	3	-	-
PC32. dispose non-recyclable and hazardous waste as per recommended processes	1	3	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	TEL/N9101
NOS Name	Organize Work and Resources as per Health and Safety Standards
Sector	Telecom
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	1
Version	2.0
Last Reviewed Date	31/01/2024
Next Review Date	31/01/2027
NSQC Clearance Date	31/01/2024

DGT/VSQ/N0102: Employability Skills (60 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. identify employability skills required for jobs in various industries

PC2. identify and explore learning and employability portals

Constitutional values – Citizenship

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

PC3. 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.

PC4. follow environmentally sustainable practices

Becoming a Professional in the 21st Century

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

PC5. recognize the significance of 21st Century Skills for employment

PC6. 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

Basic English Skills

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

PC7. use basic English for everyday conversation in different contexts, in person and over the telephone

PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC9. 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:

PC10. understand the difference between job and career

PC11. prepare a career development plan with short- and long-term goals, based on aptitude

Communication Skills

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

PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings

PC13. work collaboratively with others in a team

Diversity & Inclusion

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

PC14. communicate and behave appropriately with all genders and PwD

PC15. 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:

PC16. select financial institutions, products and services as per requirement

PC17. carry out offline and online financial transactions, safely and securely

PC18. identify common components of salary and compute income, expenses, taxes, investments etc

PC19. 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:

PC20. operate digital devices and carry out basic internet operations securely and safely

PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively

PC22. use basic features of word processor, spreadsheets, and presentations

Entrepreneurship

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

PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research

PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

PC25. 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:

PC26. identify different types of customers

PC27. identify and respond to customer requests and needs in a professional manner.

PC28. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

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

PC29. create a professional Curriculum vitae (Résumé)

PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC31. apply to identified job openings using offline /online methods as per requirement

PC32. answer questions politely, with clarity and confidence, during recruitment and selection

PC33. 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

KU11. 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 and use applications such as word processors, spreadsheets etc.

KU16. how to identify business opportunities

KU17. types and needs of customers

KU18. how to apply for a job and prepare for an interview

KU19. 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

GS2. communicate effectively using appropriate language in formal and informal settings

GS3. behave politely and appropriately with all
GS4. how to work in a virtual mode
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

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. identify employability skills required for jobs in various industries	-	-	-	-
PC2. identify and explore learning and employability portals	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC3. 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.	-	-	-	-
PC4. follow environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**2**	**4**	**-**	**-**
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. 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	-	-	-	-
Basic English Skills	**2**	**3**	**-**	**-**
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
Career Development & Goal Setting	**1**	**2**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
Communication Skills	**2**	**2**	**-**	**-**
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**2**	**-**	**-**
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
Financial and Legal Literacy	**2**	**3**	**-**	**-**
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	**3**	**4**	**-**	**-**
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Entrepreneurship	**2**	**3**	**-**	**-**
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC26. identify different types of customers	-	-	-	-
PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0102
NOS Name	Employability Skills (60 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	29/03/2023
Next Review Date	29/03/2028
NSQC Clearance Date	29/03/2023

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council.

2. 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.

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

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

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

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

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

8. 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/N4301.Install and Maintain Inverter and Battery Banks	40	50	-	10	100	25
TEL/N4302.Design and Install One-Phase and Three-Phase Electrical Systems at cell site	40	50	-	10	100	15
TEL/N4303.Install, Maintain, and Troubleshoot Electrical Components	40	50	-	10	100	15
TEL/N4304.Upgrade electrical systems to meet capacity and power quality requirements	40	50	-	10	100	15
TEL/N4305.Develop and implement telecom electrical standards	40	50	-	10	100	10
TEL/N9101.Organize Work and Resources as per Health and Safety Standards	30	60	-	10	100	10
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	10
Total	**250**	**340**	**-**	**60**	**650**	**100**

Acronyms

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

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.

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.