



Model Curriculum

QP Name: Installation Engineer - SDH, DWDM, L2 and L3 Equipment

QP Code: TEL/Q6300

QP Version: 3.0

NSQF Level: 5

Model Curriculum Version: 2.0

Telecom Sector Skill Council
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Training Parameters

Sector	Telecom
Sub-Sector	Network Managed Services
Occupation	Project Engineering
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3114.0902
Minimum Educational Qualification & Experience	<p>Completed 2nd year of 3-year/ 4-years UG OR Pursuing 2nd year of 3-year/ 4-years UG and continuing education OR Completed 2nd year of diploma (after 12th) OR Pursuing 2nd year of 2-year diploma after 12th with No Experience required OR 12th pass with 2 years of any combination of NTC/NAC/CITS or equivalent with No Experience required OR Previous relevant Qualification of NSQF Level 4 with 3-year relevant experience</p>
Pre-Requisite License or Training	Knowledge on L1 (SDH, DWDM), L2 (Switching, Routing) Technologies
Minimum Job Entry Age	21 Years
Last Reviewed On	27/01/2022
Next Review Date	27/01/2025
NSQC Approval Date	27/01/2022
QP Version	3.0
Model Curriculum Creation Date	27/01/2022
Model Curriculum Valid Up to Date	27/01/2025
Model Curriculum Version	2.0
Minimum Duration of the Course	540 Hours, 0 Minutes
Maximum Duration of the Course	540 Hours, 0 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Prepare for SDH, DWDM, L2 and L3 installation
- Connect power and traffic cable to the equipment
- Develop site acceptance testing plans and test procedures
- Configure the equipment and label ports and cables
- Assess network topology to develop commissioning plan and test procedure
- Configure the installed equipment
- Report and record the effectiveness of the installed equipment
- Plan work effectively, implement safety practices and optimize use of resources
- Interact effectively with others while being sensitive of gender and persons with disabilities

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	20:00	10:00	00:00	00:00	30:00
Role and Responsibilities of an installation engineer Module 1	20:00	10:00	00:00	00:00	30:00
TEL/N6300 – Install SDH, DWDM, L2 and L3 equipment NOS Version No. 2.0 NSQF Level 5	50:00	60:00	40:00	00:00	150:00
Module 2: Install SDH, DWDM, L2 and L3 equipment	50:00	60:00	40:00	00:00	150:00
TEL/N6301 – Undertake acceptance testing of SDH, DWDM, L2 and L3 equipment NOS Version No. 2.0 NSQF Level 5	30:00	50:00	40:00	00:00	120:00
Module 3: Perform acceptance testing	30:00	50:00	40:00	00:00	120:00
TEL/N6302 – Perform commissioning of SDH, DWDM, L2 and L3 equipment NOS Version No. 2.0 NSQF Level 5	30:00	50:00	40:00	00:00	120:00

Module 4: Perform commissioning	30:00	50:00	40:00	00:00	120:00
TEL/N9103 – Implement Effective Interaction at Workplace NOS Version No. 1.0 NSQF Level 5	10:00	20:00	00:00	00:00	30:00
Module 5: Communication and Interpersonal skills	10:00	20:00	00:00	00:00	30:00
TEL/N9104 – Manage Work, Resources and Safety at Workplace NOS Version No. 1.0 NSQF Level 5	10:00	20:00	00:00	00:00	30:00
Module 6: Working effectively and optimizing resources for a safe workplace	10:00	20:00	00:00	00:00	30:00
DGT/VSQ/N0102 Employability Skills (60 Hours)	60:00	00:00	00:00	00:00	60:00
Total Duration	210:00	210:00	120:00	00:00	540:00

Module Details

Module 1: Role and Responsibilities of an Installation Engineer Bridge Module

Terminal Outcomes:

- Identify the role and responsibilities of installation engineer

Duration: 20:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the role and responsibilities of installation engineer • List the various electrical and electronic components. • Classify the tools and equipment used in installation. • Specify the standard operating procedures (SOP) to be followed for use of tools and equipment, installation, site acceptance and commissioning. • Review the standard checklists and schedules recommended by the operating companies (OPCOs). • Prepare the schedule for carrying out inspection and repairs of the tools, equipment to maintain site. • Study the safety, health and environmental policies and regulations for the work place as well as for telecom sites in general. 	<ul style="list-style-type: none"> • Guide about the standard checklists and schedules to engineers and workers recommended by the operating companies(OPCOs). • Arrange and use the tools and equipment required for to maintain site
Classroom Aids:	
<p>Whiteboard and Markers Chart paper and sketchpens LCD Projector and Laptop for presentations</p>	
Tools, Equipment and Other Requirements	
<p>Labs equipped with the following: PCs/Laptops Internet with Wi-Fi (Min 2 Mbps Dedicated) Documents of standard operating procedures, code of conduct, checklists, schedules tools and equipment, status report</p>	

Module 2: Install SDH, DWDM, L2 and L3 Equipment

Mapped to TEL/N6300 v2.0

Terminal Outcomes:

- Prepare for installation
- Connect power and traffic cable to the equipment
- Record and report

Duration: 50:00	Duration: 60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Identify the category to which the equipment belongs • Discuss the critical punch points as per the site installation checklist • List additional equipment required for the installation • Explain the risks involved in not following the standard operation procedure • Discuss the importance of the dimension of the equipment to be installed as per installation guide • Identify the appropriate electrical cables and optical cords to be used • Explain the usage of cable and cable accessories along with the login cables • Explain the need, requirement and the process of earthing and maintaining the earthing pit to zero • Discuss the various precautions to be followed to avoid any damage to the cables and the connectors • Explain the format of the installation report to be completed after the installation process • Explain the process for obtaining sign-off from all concerned parties after the completion of the installation activities • List the types of documents to be maintained w.r.t inspection 	<ul style="list-style-type: none"> • Check availability of all parts and installation kits/racks needed for installation physically and against the bill of material • Obtain the installation plan from planning team, understand it and suggest changes to it based on viability of installation • Demonstrate how to properly order/sequence the equipment to be installed in the rack and maintain appropriate space for cables • Demonstrate how to identify the MCB to be used and check its specification and connectivity • Check the connection and routing of the power and traffic cables as well as mark the cables accordingly while following the necessary precautions • Report about the installation progress to the supervisor • Obtain sign-off from all concerned parties after the completion of the installation • Fill out formats/checklists after installation of equipment.
Classroom Aids:	
Whiteboard and Markers Chart paper and sketchpens LCD Projector and Laptop for presentations	
Tools, Equipment and Other Requirements	

SDH, L2, L3 and DWDM system

Test equipment, line tester, Ethernet tester, VSWR meter, RF power meter, Optical meter, login cables (RJ45, RS232 and Hi –Speed USB), DWDM amplifiers, MDU units, RODAM, transmission media – Optical, Electrical, cable connectors, cable ties and cable tray, Ethernet network

Module 3: Undertake Acceptance Testing (AT) of SDH, DWDM, L2 and L3 Equipment Mapped to TEL/N6301 v2.0

Terminal Outcomes:

- Develop site acceptance testing plans and test procedures
- Configure the equipment and label ports and cables
- Test effectiveness, report and record

Duration: 30:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the design and application of the equipment for which acceptance testing is to be done • Explain the technology associated with SDH, DWDM, L2 and L3 equipment along with its advantages and disadvantages • Explain the usage of cable and cable accessories along with the login cables • Explain the working and functionality of various test equipment such as line tester, Ethernet tester, VSWR meter, RF power meter etc. • List the various administrative jobs that need to be carried out post testing activities • Explain the process for obtaining sign-off from all concerned parties after completion of the 'Acceptance Test' procedure • List the types of records and documents to be updated w.r.t inspection and result of not maintaining the same 	<ul style="list-style-type: none"> • Prepare an acceptance and maintenance test plan for the equipment and update it regularly • Verify the above plan from the concerned person and incorporate the feedback suggested • Demonstrate the process to check for power connectivity and switch on the power • Perform configuration of the equipment as per the acceptance test plan and verify against the configuration checklist • Label the port numbers after arranging the stickers and as per the guidelines mentioned in the acceptance testing plan • Test the equipment by making use of test cases • Prepare and update the test report based on the test result • Obtain signature from all concerned parties after the completion of equipment testing • Perform administrative jobs like site clearance, return of test equipment etc. • Maintain, update and ensure the availability of records/ documents related to testing of equipment to all the concerned people
Classroom Aids:	
Whiteboard and Markers Chart paper and sketchpens LCD Projector and Laptop for presentations	

Tools, Equipment and Other Requirements

SDH, L2, L3 and DWDM system

Test equipment, line tester, Ethernet tester, VSWR meter, RF power meter, Optical meter, login cables (RJ45, RS232 and Hi –Speed USB), DWDM amplifiers, MDU units, RODAM, transmission media – Optical, Electrical, cable connectors, cable ties and cable tray, Ethernet network

Module 4: Perform Commissioning of SDH, DWDM, L2 and L3 Equipment Mapped to TEL/N6302 v2.0

Terminal Outcomes:

- Assess network topology to develop commissioning plan and test procedure
- Configure the installed equipment
- Report and record the test effectiveness of the installed equipment

Duration: 30:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the architecture and protocol of different types of networks such as LAN, WAN etc. • Discuss the design and application of the equipment for which commissioning is to be done • Explain the network topology, features, functioning associated with SDH, LAN, WAN equipment along with its advantages and disadvantages • Explain the IP protocols being used along with the network concepts • Explain the working and functionality of Ethernet, media and connector etc. • List the various administrative jobs that need to be carried out post testing activities • List the types of records and documents to be updated w.r.t inspection and result of not maintaining the same 	<ul style="list-style-type: none"> • Employ appropriate techniques to ensure availability of the equipment • Prepare, record and save commissioning plan for the equipment • Demonstrate the process to check for power connectivity and switch on the power • Perform configuration of the equipment as per the commissioning guide and verify against the configuration checklist • Test the equipment by making use of test cases • Prepare and update the test report based on the test result • Perform administrative jobs like site clearance, return of test equipment etc. • Maintain, update and ensure the availability of records/ documents related to testing of equipment to all the concerned people
Classroom Aids:	
Whiteboard and Markers Chart paper and sketchpens LCD Projector and Laptop for presentations	
Tools, Equipment and Other Requirements	
SDH, L2, L3 and DWDM system Test equipment, line tester, Ethernet tester, VSWR meter, RF power meter, Optical meter, login cables (RJ45, RS232 and Hi –Speed USB), DWDM amplifiers, MDU units, RODAM, transmission media – Optical, Electrical, cable connectors, cable ties and cable tray, Ethernet network	

Module 5: Communication and Interpersonal skills

Mapped to TEL/N9103 v1.0

Terminal Outcomes:

- Communicate effectively and develop interpersonal skills
- Develop sensitivity towards differently abled people.

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Identify roles and responsibilities and understand organisation’s policies. • List organisational guidelines for dress code, time schedules, language and other soft skill aspects. • List the different methods of communication. • Explain the importance of effective communication and interpersonal skills. • Analyse the common reasons for interpersonal conflicts and ways of managing them effectively. • Identify types of information needed by colleagues and its importance. • Identify the need for implementing standards, guidelines and practices pertaining to gender sensitivity, including work ethics and workplace etiquettes. • Explain the work ethics, workplace etiquettes as well as standards and guidelines for all genders and PwD. • List health and safety requirements for persons with disability. • List the rights, duties and benefits available at workplace for person with disability. • Identify the process of recruiting people with disability for a specific job. • Analyse the specific ways to help persons with disability overcome the challenges. 	<ul style="list-style-type: none"> • Demonstrate how to interact with superiors in terms of escalating problems, reporting work completion and receiving feedback. • Apply team building skills to assist colleagues in maximizing effectiveness and efficiency of carrying out tasks. • Demonstrate appropriate communication skills and etiquettes while interacting with others. • Resolve conflicts with colleagues and adhere to commitment. • Demonstrate ideal workplace ethics while interacting with colleagues with respect to sharing information, co-ordinating work and showing respect. • Follow organisation’s policy for working with team members. • Illustrate importance of team goals over individual goals. • Use inclusive language irrespective of the gender/ disability of the person. • Demonstrate appropriate behaviour towards all genders and differently abled people.
Classroom Aids:	
White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure.	

White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector

Tools, Equipment and Other Requirements

Sample of escalation matrix, organisation structure.

Module 6: Working effectively and optimizing resources for a safe workplace

Mapped to TEL/N9104 v1.0

Terminal Outcomes:

- Plan work effectively, implement safety practices and optimize use of resources

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> List the importance of following the standard operating procedures of the company w.r.t. privacy, confidentiality and security. List the key performance indicators for the new tasks. Identify the opportunities for team building workshops and motivational trainings. List and explain work requirements to be followed by the team. Identify the issues with and handle them. Discuss correct way to show emotions at workplace. Describe the importance of timely completion of tasks. Explain the importance of escalation matrix. Explain the importance of providing and receiving feedback constructively. Analyse ways to optimize usage of resources. List the importance, cause and effect of greening of jobs. Identify different types of hazards such as illness, accidents, fires etc. List the causes of risks and potential hazards in a work area and ways to prevent them. List the steps to report accident and health related issues as per SOP. Explain the concept of waste management. List the methods of waste disposal. Identify the different categories of waste for the purpose of segregation. Differentiate between recyclable and non-recyclable waste. 	<ul style="list-style-type: none"> Demonstrate techniques to save on cost and time. Demonstrate routine cleaning of tools, equipment and machines to ensure team follows the same. Use resources such as water judiciously. Check for malfunctions in equipment and report as per SOP. Report any breaches in safety and security to the concerned person. Illustrate ways to keep work area clean such as mopping spills and leaks, cleaning grease stains etc. Check for spills and leaks and plug the same. Demonstrate segregation of types of hazardous waste. Illustrate steps to minimise waste. Illustrate proper waste disposal procedures and how to dispose-off hazardous waste. Illustrate ways to find exact cause of a problem and validate the same in case done by a team member.

- List electronic waste disposal procedures.

Classroom Aids:

White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector

Tools, Equipment and Other Requirements

Personal Protection Equipment: safety glasses, head protection, rubber gloves, safety footwear, warning signs and tapes, fire extinguisher and first aid kit

Module 7: On-the-Job Training

Mapped to Installation Engineer - SDH, DWDM, L2 and L3 Equipment

Mandatory Duration: 120:00	Recommended Duration: 00:00
Location: On-Site	
Terminal Outcomes	
<ol style="list-style-type: none"> 1. Check availability of all parts and installation kits/racks. 2. Acquire the installation plan from the planning team. 3. Order/sequence the equipment to be installed in the rack and maintain appropriate space for cables. 4. Discover the MCB to be used and check its specification and connectivity. 5. Check the connection and routing of the power and traffic cables. 6. Record details in formats/checklists after installation of equipment. 7. Prepare an acceptance and maintenance test plan. 8. Check for power connectivity and switch on the power. 9. Configure the equipment as per the acceptance test plan and verify against the configuration checklist. 10. Label the port numbers after arranging the stickers. 11. Check the equipment using test cases. 12. Get sign off from all concerned parties after the completion of equipment testing. 13. Perform administrative tasks. 14. Plan, record and save commissioning details for the equipment. 15. Test power connectivity and switch on the power. 16. Provide records/ documents related to testing of equipment o concerned personnel. 	

Module 8: DGT/VSQ/N0102 Employability Skills (60 hours)

Mapped to Installation Engineer - SDH, DWDM, L2 and L3 Equipment

Mandatory Duration: 60:00

Location: On-Site

S.No.	Module Name	Key Learning Outcomes	Duration (hours)
1.	Introduction to Employability Skills	<ul style="list-style-type: none"> Discuss the Employability Skills required for jobs in various industries. List different learning and employability related GOI and private portals and their usage. 	1.5
2.	Constitutional values - Citizenship	<ul style="list-style-type: none"> Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen. Show how to practice different environmentally sustainable practices. 	1.5
3.	Becoming a Professional in the 21st Century	<ul style="list-style-type: none"> Discuss importance of relevant 21st century skills. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life. Describe the benefits of continuous learning. 	2.5
4.	Basic English Skills	<ul style="list-style-type: none"> Show how to use basic English sentences for every day conversation in different contexts, in person and over the telephone. Read and interpret text written in basic English Write a short note/paragraph / letter/e -mail using basic English. 	10
5.	Career Development & Goal Setting	<ul style="list-style-type: none"> Create a career development plan with well-defined short- and long-term goals. 	2
6.	Communication Skills	<ul style="list-style-type: none"> Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette. Explain the importance of active listening for effective communication. Discuss the significance of working collaboratively with others in a team. 	5
7.	Diversity & Inclusion	<ul style="list-style-type: none"> Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD. Discuss the significance of escalating sexual harassment issues as per POSH act. 	2.5
8.	Financial and Legal Literacy	<ul style="list-style-type: none"> Outline the importance of selecting the right financial institution, product, and service. Demonstrate how to carry out offline and online financial transactions, safely and securely. List the common components of salary and compute income, expenditure, taxes, investments etc. Discuss the legal rights, laws, and aids. 	5
9.	Essential Digital Skills	<ul style="list-style-type: none"> Describe the role of digital technology in today's life. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely. 	10

		<ul style="list-style-type: none"> • Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely. • Create sample word documents, excel sheets and presentations using basic features. • Utilize virtual collaboration tools to work effectively. 	
10.	Entrepreneurship	<ul style="list-style-type: none"> • Explain the types of entrepreneurship and enterprises. • Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan. • Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement. • Create a sample business plan, for the selected business opportunity. 	7
11	Customer Service	<ul style="list-style-type: none"> • Describe the significance of analyzing different types and needs of customers. • Explain the significance of identifying customer needs and responding to them in a professional manner. • Discuss the significance of maintaining hygiene and dressing appropriately. 	5
12	Getting Ready for Apprenticeship & Jobs	<ul style="list-style-type: none"> • Create a professional Curriculum Vitae (CV). • Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively. • Discuss the significance of maintaining hygiene and confidence during an interview. • Perform a mock interview. • List the steps for searching and registering for apprenticeship opportunities. 	8

LIST OF TOOLS & EQUIPMENT FOR EMPLOYABILITY SKILLS

S No.	Name of the Equipment	Quantity
1.	Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below)	As required
2.	UPS	As required
3.	Scanner cum Printer	As required
4.	Computer Tables	As required
5.	Computer Chairs	As required
6.	LCD Projector	As required
7.	White Board 1200mm x 900mm	As required

Note: Above Tools & Equipment not required, if Computer LAB is available in the institute.

Annexure

Trainer Requirements (Installation Engineer - SDH, DWDM, L2 and L3 Equipment)

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate	B.E./B.Tech/ BCA/B.Sc	3	Network Management	0		Eligible for ToT program

Trainer Certification	
Domain Certification	Platform Certification
Job Role: “Installation Engineer – SDH, DWDM, L2 and L3 Equipment Level 5” “TEL/Q6300 v3.0”, Minimum accepted score is 80%	Job Role: “Trainer (VET and Skills)”, “MEP/Q2601 v2.0”, Minimum accepted score is 80%

Assessor Requirements (Installation Engineer - SDH, DWDM, L2 and L3 Equipment)

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate	B.E./B.Tech/BC A/B.Sc	3	Network Management	0		Eligible for ToA program

Assessor Certification	
Domain Certification	Platform Certification
Job Role: "Installation Engineer – SDH, DWDM, L2 and L3 Equipment Level 5" "TEL/Q6300 v3.0", Minimum accepted score is 80%	Job Role: "Assessor (VET and Skills)", "MEP/Q2701 v2.0", Minimum accepted score is 80%

Trainer Requirements (Employability Skills 60 hours)

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate/CITS	Any discipline			2	Teaching experience	Prospective ES trainer should: <ul style="list-style-type: none"> • have good communication skills • be well versed in English • have digital skills • have attention to detail • be adaptable • have willingness to learn
Current ITI trainers	Employability Skills Training (3 days full-time course done between 2019-2022)					
Certified current EEE trainers (155 hours)	from Management SSC (MEPSC)					
Certified Trainer	Qualification Pack: Trainer (MEP/Q0102)					

Trainer Certification	
Domain Certification	Platform Certification
Certified in 60-hour Employability NOS (2022), with a minimum score of 80% OR Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of 80%	NA

Master Trainer Requirements (Employability Skills 60 hours)

Master Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate/CITS	Any discipline			3	Employability Skills curriculum training experience with an interest to train as well as orient other peer trainers	Prospective ES Master trainer should: <ul style="list-style-type: none"> • have good communication skills • be well versed in English • have basic digital skills
Certified Master Trainer	Qualification Pack: Master Trainer (MEP/Q2602			3	EEE training of Management SSC (MEPSC) (155 hours)	<ul style="list-style-type: none"> • have attention to detail • be adaptable • have willingness to learn • be able to grasp concepts fast and is creative with teaching practices and likes sharing back their learning with others

Master Trainer Certification	
Domain Certification	Platform Certification
Certified in 60-hour Employability NOS (2022), with a minimum score of 90% . OR Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of 90%	NA

Assessment Strategy

1. Assessment System Overview:
 - Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email
 - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
 - Assessment agency deploys the ToA certified Assessor for executing the assessment
 - SSC monitors the assessment process & records
2. Testing Environment:
 - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
 - Check the duration of the training.
 - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
 - If the batch size is more than 30, then there should be 2 Assessors.
 - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
 - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
 - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
 - Check the availability of the Lab Equipment for the particular Job Role.
3. Assessment Quality Assurance levels / Framework:
 - Question papers created by the Subject Matter Experts (SME)
 - Question papers created by the SME verified by the other subject Matter Experts
 - Questions are mapped with NOS and PC
 - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
 - Assessor must be ToA certified & trainer must be ToT Certified
 - Assessment agency must follow the assessment guidelines to conduct the assessment
4. Types of evidence or evidence-gathering protocol:
 - Time-stamped & geotagged reporting of the assessor from assessment location
 - Center photographs with signboards and scheme specific branding
 - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
 - Time-stamped & geotagged assessment (Theory+ Viva + Practical) photographs & videos
5. Method of verification or validation:
 - Surprise visit to the assessment location
 - Random audit of the batch
 - Random audit of any candidate
6. Method for assessment documentation, archiving, and access
 - Hard copies of the documents are stored
 - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
 - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

Assessment Strategy (Employability Skills 60 hours)

The trainee will be tested for the acquired skill, knowledge and attitude through formative/summative assessment at the end of the course and as this NOS and MC is adopted across sectors and qualifications, the respective AB can conduct the assessments as per their requirements.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training .
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module . A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
SOP	Standard Operating Procedures
BOM	Bill of Material
SDH	Synchronous Digital Hierarchy
PDH	Plesiochronous Digital Hierarchy
DWDM	Dense Wavelength Division Multiplexing
L2	Layer 2, i.e. Data link layer standard of OSI architecture
L3	Layer 3, i.e. Network layer standard of OSI architecture
AT	Acceptance Testing
MCB	Miniature Circuit Breaker
NOC	Network Operating Centre
SLA	Service Level Agreement
LAN	Local Area Network
WAN	Wide Area Network
MAN	Metropolitan Area Network
VLAN	Virtual Local Area Network
RF	Radio Frequency
VSWR	Voltage Standing Wave Ratio, it is a measure of the reflected power on a transmission line
OSI	Open Systems Interconnection
ES	Employability Skills