



## QUALIFICATION FILE

### Telecom Electrician (Advanced)

Short Term Training (STT)  Long Term Training (LTT)  Apprenticeship

Upskilling  Dual/Flexi Qualification  For ToT  For ToA

General  Multi-skill (MS)  Cross Sectoral (CS)  Future Skills  OEM

NCrF/NSQF Level:4

Submitted By:

Telecom Sector Skill Council

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## Table of Contents

Section 1: Basic Details .....	3
Section 2: Module Summary .....	5
NOS/s of Qualifications.....	5
Mandatory NOS/s:.....	5
Elective NOS/s: .....	6
Optional NOS/s:.....	6
Assessment - Minimum Qualifying Percentage.....	6
Section 3: Training Related.....	7
Section 4: Assessment Related.....	7
Section 5: Evidence of the need for the Qualification.....	8
Section 6: Annexure & Supporting Documents Check List.....	8
Annexure: Evidence of Level .....	9
Annexure: Tools and Equipment (Lab Set-Up) .....	12
Annexure: Industry Validations Summary.....	22
Annexure: Training & Employment Details .....	23
Annexure: Blended Learning .....	25
Annexure: Detailed Assessment Criteria .....	26
Annexure: Assessment Strategy .....	42
Assessment Strategy (Employability Skills 60 hours) .....	43
Annexure: Acronym and Glossary .....	44

### Section 1: Basic Details

1.	<b>Qualification Name</b>	Telecom Electrician (Advanced)																			
2.	<b>Sector/s</b>	Telecom																			
3.	<b>Type of Qualification:</b> <input checked="" type="checkbox"/> New <input type="checkbox"/> Revised <input type="checkbox"/> Has Electives/Options <input type="checkbox"/> OEM	<b>NQR Code &amp; version of existing/previous qualification:</b> (change to previous, once approved) NA	<b>Qualification Name of existing/previous version:</b> NA																		
4.	<b>a. OEM Name</b> <b>b. Qualification Name</b> (Wherever applicable)	NA																			
5.	<b>National Qualification Register (NQR) Code &amp;Version</b> (Will be issued after NSQC approval)	QG-04-TL-01997-2024-V1-TSSC	<b>6. NCrf/NSQF Level:</b> 4																		
7.	<b>Award (Certificate/Diploma/Advance Diploma/ Any Other</b> (Wherever applicable specify multiple entry/exits also & provide details in annexure)	Certificate																			
8.	<b>Brief Description of the Qualification</b>	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.																			
9.	<b>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</b>	<b>a. Entry Qualification &amp; Relevant Experience:</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">S. No.</th> <th style="width: 60%;">Academic/Skill Qualification (with Specialization - if applicable)</th> <th style="width: 30%;">Required Experience (with Specialization - if applicable)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>12th Grade Pass or equivalent</td> <td>1-year relevant experience</td> </tr> <tr> <td>2.</td> <td>11th Grade Pass</td> <td>1 year relevant experience</td> </tr> <tr> <td>2.</td> <td>10th Grade Pass</td> <td>2 year relevant experience</td> </tr> <tr> <td>3.</td> <td>10th Grade Pass</td> <td>3-year diploma in relevant field</td> </tr> <tr> <td>4.</td> <td>Previous relevant Qualification (Telecom Electrician (Basic)) of NSQF level 3</td> <td>3-year relevant experience</td> </tr> </tbody> </table> <b>b. Age:</b> 18 Years		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1.	12th Grade Pass or equivalent	1-year relevant experience	2.	11th Grade Pass	1 year relevant experience	2.	10th Grade Pass	2 year relevant experience	3.	10th Grade Pass	3-year diploma in relevant field	4.	Previous relevant Qualification (Telecom Electrician (Basic)) of NSQF level 3	3-year relevant experience
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4.	Previous relevant Qualification (Telecom Electrician (Basic)) of NSQF level 3	3-year relevant experience																			
10.	<b>Credits Assigned to this Qualification, Subject to Assessment</b> (as per National Credit Framework (NCrf))	15	<b>11. Common Cost Norm Category (I/II/III)</b> (wherever applicable): I																		

12.	<b>Any Licensing requirements for Undertaking Training on This Qualification</b> <i>(wherever applicable)</i>	NA																						
13.	<b>Training Duration by Modes of Training Delivery</b> <i>(Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</i>	<input checked="" type="checkbox"/> Offline <input type="checkbox"/> Online <input type="checkbox"/> Blended <table border="1"> <thead> <tr> <th>Training Delivery Modes</th> <th>Theory (Hours)</th> <th>Practical (Hours)</th> <th>OJT Mandatory (Hours)</th> <th>OJT Recommended (Hours)</th> <th>Total (Hours)</th> </tr> </thead> <tbody> <tr> <td>Classroom (offline)</td> <td>150:00</td> <td>180:00</td> <td>120:00</td> <td>00:00</td> <td>450:00</td> </tr> <tr> <td>Online</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p><i>(Refer Blended Learning Annexure for details)</i></p>					Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	150:00	180:00	120:00	00:00	450:00	Online					
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Online																								
14.	<b>Aligned to NCO/ISCO Code/s</b> <i>(if no code is available mention the same)</i>	NCO-2015/7422.9900																						
15.	<b>Progression path after attaining the qualification</b> <i>(Please show Professional and Academic progression)</i>	<b>Vertical progression</b> (Level – 5) Lead Telecom Electrician																						
16.	<b>Other Indian languages in which the Qualification &amp; Model Curriculum are being submitted</b>	Hindi																						
17.	<b>Is similar Qualification(s) available on NQR-if yes, justification for this qualification</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No URLs of similar Qualifications:																						
18.	<b>Is the Job Role Amenable to Persons with Disability</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If "Yes", specify applicable type of Disability:																						
19.	<b>How Participation of Women will be Encouraged</b>	Yes, Encouraging the participation of women is essential for promoting gender equality and ensuring that women have equal opportunities in various aspects of society. It is important to provide education, mentorship, and networking opportunities, as well as training and development programs. Flexible work arrangements and promoting successful women in this job role can also inspire and encourage women to pursue careers in this field. Creating a culture of inclusion and diversity can help women feel welcome and valued in this job roles, through policies and practices that support work-life balance, equal pay and promotion opportunities, and a safe and respectful workplace.																						
20.	<b>Are Greening/ Environment Sustainability Aspects Covered</b> <i>(Specify the NOS/Module which covers it)</i>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No TEL/N9101																						
21.	<b>Is Qualification Suitable to be Offered in Schools/Colleges</b>	Schools <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Colleges <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																						
22.	<b>Name and Contact Details of Submitting / Awarding Body SPOC</b> <i>(In case of CS or MS, provide details of both Lead AB &amp; Supporting ABs)</i>	Name: Sanjay Mehrotra Email: <a href="mailto:sanjay.mehrotra@tsscindia.com">sanjay.mehrotra@tsscindia.com</a> Contact No.: 0124-4148029 Website: <a href="https://www.tsscindia.com">https://www.tsscindia.com</a>																						
23.	<b>Final Approval Date by NSQC: 31.01.2024</b>	24. Validity Duration: 3 Years		25. Next Review Date: 31.01.2027																				

## Section 2: Module Summary

### NOS/s of Qualifications

(In exceptional cases these could be described as components)

#### Mandatory NOS/s:

Specify the training duration and assessment criteria at NOS/ Module level. For further details refer curriculum document.

*Th.-Theory Pr.-Practical OJT-On the Job Man.-Mandatory Training Rec.-Recommended Proj.-Project*

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1.	Introduction to the role of a Telecom Electrician (Advanced)	Bridge Module	-	4	1	20:00	10:00	00:00	-	30:00	-	-	-	-	-	-
2.	Install and Maintain Inverter and Battery Banks	TEL/N4301 Version 1.0	Core	4	1	10:00	20:00	00:00	-	30:00	40	50	-	10	100	25
3.	Design and Install One-Phase and Three-Phase Electrical Systems at cell site	TEL/N4302 Version 1.0	Core	4	2	10:00	20:00	30:00	-	60:00	40	50	-	10	100	15
4.	Install, Maintain, and Troubleshoot Electrical Components	TEL/N4303 Version 1.0	Core	4	3	20:00	40:00	30:00	-	90:00	40	50	-	10	100	15
5.	Upgrade electrical systems to meet capacity and power quality requirements	TEL/N4304 Version 1.0	Core	4	3	10:00	50:00	30:00	-	90:00	40	50	-	10	100	15
6.	Develop and implement telecom electrical standards	TEL/N4305 Version 1.0	Core	4	2	10:00	20:00	30:00	-	60:00	40	50	-	10	100	10
7.	Organise Work and Resources as per Health and Safety Standards	TEL/N9101 Version 2.0	Non-Core	3	1	10:00	20:00	00:00	-	30:00	30	60	-	10	100	10
8.	Employability Skills (60 Hours)	DGT/VSQ/N 0102: Version 1.0	Non-Core	3	2	60:00	00:00	00:00	-	60:00	20	30	-	-	50	10
<b>Duration (in Hours) / Total Marks</b>					<b>15</b>	<b>150:00</b>	<b>180:00</b>	<b>120:00</b>		<b>450:00</b>	<b>250</b>	<b>340</b>	<b>-</b>	<b>60</b>	<b>650</b>	

**Elective NOS/s:**

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NS QF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1.																
2.																
<b>Duration (in Hours) / Total Marks</b>																

**Optional NOS/s:**

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NS QF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1.																
2.																
<b>Duration (in Hours) / Total Marks</b>																

**Assessment - Minimum Qualifying Percentage**

Please specify **any one** of the following:

**Minimum Pass Percentage – Aggregate at qualification level: 70%** (Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)

**Minimum Pass Percentage – NOS/Module-wise: \_\_\_\_%** (Every Trainee should score specified minimum passing percentage in each mandatory and selected elective NOS/Module to successfully clear the assessment.)

### Section 3: Training Related

1.	<b>Trainer’s Qualification and experience in the relevant sector (in years)</b> <i>(as per NCVET guidelines)</i>	3 years in Engineering Diploma in (Electrical/Electronics) after 10 <sup>th</sup> with 5 years industrial relevant experience or 10 years of teaching experience OR Graduate (Electrical/Electronics) with 3 years of industry relevant experience or 6 years of teaching experience
2.	<b>Master Trainer’s Qualification and experience in the relevant sector (in years)</b> <i>(as per NCVET guidelines)</i>	Diploma (Science/Electronics/ Telecom/IT and other related domains) with 8 years of industrial relevant experience required in Eligible for ToT program. <b>OR</b> Graduate (Science/Electronics/ Telecom/IT and other relevant domains) with 7 years of industry relevant experience required
3.	<b>Tools and Equipment Required for Training</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>(If “Yes”, details to be provided in Annexure)</i>
4.	<b>In Case of Revised Qualification, Details of Any Upskilling Required for Trainer</b>	NA

### Section 4: Assessment Related

1.	<b>Assessor’s Qualification and experience in relevant sector (in years)</b> <i>(as per NCVET guidelines)</i>	Diploma (Science/Electronics/ Telecom/IT and other related domains) after 10 <sup>th</sup> with 5 years of industrial relevant experience required <b>OR</b> Graduate (Science/Electronics/ Telecom/IT and other relevant domains) with 3 years of industry relevant experience required
2.	<b>Proctor’s Qualification and experience in relevant sector (in years)</b> <i>(as per NCVET guidelines)</i>	3 years in Engineering Diploma in (Science/Electronics/ Telecom/IT and other related domains) after 10 <sup>th</sup> with 5 years of industrial relevant experience required <b>OR</b> Graduate (Science/Electronics/ Telecom/IT and other relevant domains) with 3 years of industry relevant experience required
3.	<b>Lead Assessor’s/Proctor’s Qualification and experience in relevant sector (in years)</b> <i>(as per NCVET guidelines)</i>	3 years in Engineering Diploma in (Science/Electronics/ Telecom/IT and other related domains) with 8 years of industrial relevant experience required in Eligible for ToT program. <b>OR</b> Graduate (Science/Electronics/ Telecom/IT and other relevant domains) with 7 years of industry relevant experience required
4.	<b>Assessment Mode</b> <i>(Specify the assessment mode)</i>	Offline or Blended
5.	<b>Tools and Equipment Required for Assessment</b>	<input checked="" type="checkbox"/> Same as for training <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(details to be provided in Annexure-if it is different for Assessment)</i>

## Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	<b>Latest Skill Gap Study (not older than 2 years) (Yes/No):</b> Yes
2.	<b>Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):</b> Yes
3.	<b>Government /Industry initiatives/ requirement (Yes/No):</b> Yes
4.	<b>Number of Industry validation provided:</b>
5.	<b>Estimated nos. of persons to be trained and employed:</b> 22,400
6.	<b>Evidence of Concurrence/Consultation with Line Ministry/State Departments:</b> <i>Approved</i> If "No", why:

## Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	<b>Annexure:</b> NCrf/NSQF level justification based on NCrf level/NSQF descriptors <i>(Mandatory)</i>	Yes
2.	<b>Annexure:</b> List of tools and equipment relevant for qualification <i>(Mandatory, except in case of online course)</i>	Yes
3.	<b>Annexure:</b> Detailed Assessment Criteria <i>(Mandatory)</i>	Yes
4.	<b>Annexure:</b> Assessment Strategy <i>(Mandatory)</i>	Yes
5.	<b>Annexure:</b> Blended Learning <i>(Mandatory, in case selected Mode of delivery is "Blended Learning")</i>	No
6.	<b>Annexure:</b> Multiple Entry-Exit Details <i>(Mandatory, in case qualification has multiple Entry-Exit)</i>	Yes
7.	<b>Annexure:</b> Acronym and Glossary <i>(Optional)</i>	Yes
8.	<b>Supporting Document:</b> Model Curriculum <i>(Mandatory – Public view)</i>	Yes
9.	<b>Supporting Document:</b> Career Progression <i>(Mandatory - Public view)</i>	Yes
10.	<b>Supporting Document:</b> Occupational Map <i>(Mandatory)</i>	Yes
11.	<b>Supporting Document:</b> Assessment SOP <i>(Mandatory)</i>	Yes
12.	<b>Any other document you wish to submit:</b>	No

### Annexure: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/NSQF Level
<p><b>Professional Theoretical Knowledge/Process</b></p>	<p>The job description for a Telecom Electrician (Advanced) in India calls for a deep understanding of telecom electrical systems, as well as the installation, upkeep, and troubleshooting of associated equipment. The capacity to identify and fix electrical problems, deal with electrical components practically, and have a solid understanding of safety regulations and electrical codes are all essential. The National Skills Qualification Framework (NSQF) at Level 4, which denotes domain proficiency, is normally associated with the qualifications for this position. In the telecom electrical area, this level descriptor indicates that a person has the knowledge and abilities to operate autonomously, manage activities, and deliver technical solutions while maintaining compliance with existing standards and regulations.</p>	<p>In India, the position of Telecom Electrician (Advanced) necessitates a number of essential skills and accomplishments. These include having a solid grasp of electrical systems and safety requirements, being skilled in installing and maintaining telecom electrical components, being able to identify and fix problems, being aware of pertinent codes and regulations, and having good communication skills for both teamwork and customer interactions. Professionals in this role must possess the competencies required to meet industry standards and provide high-quality telecom electrical services. This role is typically aligned with the NSQF Level 4, indicating a requirement for moderate to high-level skills and expertise in telecommunications and electrical systems.</p>	<p>4</p>
<p><b>Professional and Technical Skills/ Expertise/ Professional Knowledge</b></p>	<p>To succeed in this position, Telecom Electricians (Advanced) need a trifecta of specialized knowledge, technical proficiency, and professional abilities. They should be well-versed in electrical concepts and abilities, with the capacity to recognize and reduce electrical risks, set up safety equipment, and manage power systems in the telecommunications sector. It is imperative to possess the ability to comprehend and implement pertinent electrical codes and standards. Telecom Electricians (Advanced) also need to know how to install, maintain, and repair electrical components, like batteries and power backup systems, while adhering to national and international laws. To succeed in this position, one must possess</p>	<p>According to the National Career Readiness Framework (NCRF) and National Skills Qualification Framework (NSQF), a telecom electrician's employment in India requires a wide range of professional and technical abilities. Expertise in electrical systems, telecommunications infrastructure, and power backup solutions is required for professionals in this position. They should be skilled in setting up grounding systems, choosing and configuring protective devices, detecting and maintaining faults, conducting risk assessments, and making sure that electrical codes and standards are followed. They must also be experts in cable installation, network device configuration, hardware selection, and network topology design. Moreover, a strong understanding of</p>	<p>4</p>

	<p>strong problem-solving skills as well as the capacity to collaborate with others in a team.</p>	<p>safety protocols, emergency response planning, and compliance with local and international regulations is vital. These skills and knowledge are typically associated with NSQF Level 4, representing a high degree of specialization and proficiency in the Telecom Electrician (Advance) domain.</p>	
<p><b>Employment Readiness &amp; Entrepreneurship Skills &amp; Mind-set/Professional Skill</b></p>	<p>A proactive professional mentality, excellent entrepreneurship and career readiness abilities, and a proactive work ethic are all necessary for the position of a Telecom Electrician (Advanced). These include having a strong work ethic, being technically proficient in electrical systems, being able to adapt to quickly changing technology, having outstanding problem-solving skills, being a team player and committed to safety and compliance. In order to contribute to the effective and dependable operation of electrical systems in this dynamic field, telecom electricians should also have an entrepreneurial mindset in addition to project management, resource optimization, and the ability to spot opportunities for innovation and affordable solutions within the telecommunications industry.</p>	<p>Employment Readiness and Entrepreneurship Skills for the job role of a Telecom Electrician at the NCrf/NSQF level descriptor encompass the ability to adapt to changing technology, work collaboratively with diverse teams, and demonstrate strong problem-solving and communication skills. This role also requires a proactive approach to learning, staying updated with industry trends, and fostering a safety-conscious mindset. Entrepreneurship skills include an understanding of market trends, customer service orientation, and the capacity to identify opportunities for business growth. A professional skill set for this role involves proficiency in electrical systems, safety protocols, and equipment maintenance, with a strong focus on adhering to regulatory standards and promoting a culture of continuous improvement. This skill combination aligns with NCrf/NSQF level descriptors, emphasizing a balance of practical expertise and essential employability and entrepreneurial competencies.</p>	<p>4</p>
<p><b>Broad Learning Outcomes/Core Skill</b></p>	<p>The ability to install, maintain, and troubleshoot electrical systems and components in the telecommunications industry is one of the important learning outcomes and fundamental skills for the job role of a Telecom Electrician (Advanced). This involves locating and reducing electrical risks, making sure that all applicable laws and regulations are followed, choosing the right safety equipment, setting up protection parameters, setting up grounding systems, and adding redundancy for dependability. In</p>	<p>In India, the National Skills Qualifications Framework (NSQF) describes the work position of a Telecom Electrician at different levels, particularly at Level 4. The fundamental competencies and extensive learning objectives for this position include the capacity to install, maintain, and troubleshoot telecom electrical systems; follow safety guidelines and rules; recognize and reduce possible electrical risks; collaborate well with others; exhibit competence with power backup systems; and</p>	<p>4</p>

	<p>addition, telecom electricians are supposed to set up protection relays, use fault detection techniques, analyze arc flash hazards, and keep thorough records. They must continuously assess and improve systems, comply with regulations, and develop emergency response plans. Additionally, they should have skills related to network infrastructure, including designing topologies, selecting hardware, cable routing, and security measures, as well as the ability to troubleshoot network issues and develop contingency plans for emergencies, ensuring optimal telecom system functionality and safety.</p>	<p>apply electrical codes and standards. In-depth understanding and hands-on experience with Telecom Electrical (Advance) systems, including protection system design and implementation, grounding and bonding, and protective device setup, are expected of telecom electricians. They should also excel in documentation, testing, maintenance, and continuous improvement of these systems. At NSQF Level 4, Telecom Electricians (Advanced) are skilled professionals capable of performing these tasks autonomously, contributing to the telecommunications industry's efficiency and reliability.</p>	
<p><b>Responsibility</b></p>	<p>In the telecommunications sector, telecom electricians are in charge of making sure electrical systems run well. Installing, maintaining, and troubleshooting electrical components—such as inverters, batteries, and power backup systems—are among their core duties. They have to follow safety procedures, evaluate any risks, and perform risk analyses to figure out how safe they are. To avoid electrical failures and dangers, Telecom Electricians (Advanced) also maintain up-to-date knowledge of pertinent electrical regulations and standards, setup protective devices, set up grounding and bonding systems, and carry out arc flash hazard analysis. They work to maintain accurate documentation, develop maintenance plans, and continuously improve systems while complying with local and international regulations. Additionally, they may play a crucial role in emergency response planning and coordination to minimize downtime and ensure safety in the event of electrical faults.</p>	<p>Installing, maintaining, and troubleshooting telecom electrical systems and power backup equipment are among the duties of a Telecom Electrician (Advanced) that correspond with the National Skills Qualification Framework (NSQF) Level Descriptor for the position. They have to follow safety guidelines, perform risk assessments, and keep up with applicable laws and rules (NSQF Level 4). They are also in charge of setting up protective systems, putting redundancy in place for fault tolerance, and making sure that local and international laws are followed (NSQF Level 5). Telecom Electricians may progress to roles like Lead Electricians and Telecom Electrical Technicians, reflecting an increased proficiency and complexity of tasks associated with NSQF Level 6. As they move into supervisory and management positions, they are required to exhibit advanced skills in team management, project planning, and strategic decision-making, aligning with NSQF Level 4 and beyond.</p>	<p>4</p>

### Annexure: Tools and Equipment (Lab Set-Up)

#### List of Tools and Equipment

Batch Size: 30

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1.	Routers	<p>Key Specifications:</p> <ul style="list-style-type: none"> <li>Forwarding Rate: Measured in packets per second (pps), determines how quickly the router can process and forward packets.</li> <li>Interface Speeds: Indicate the maximum data transfer rates for each interface, commonly ranging from 100 Mbps to 100 Gbps.</li> <li>Routing Protocols: Supported protocols (e.g., OSPF, BGP, RIP) dictate how the router learns and maintains network paths.</li> <li>Memory: RAM and storage capacity influence performance and route table storage.</li> <li>CPU: Processing power affects overall performance and the ability to handle complex routing tasks.</li> <li>Queue Size: Determines how many packets can be held per interface before congestion occurs.</li> <li>QoS Features: Support for Quality of Service mechanisms ensures prioritization of critical traffic.</li> </ul>	120
2.	Switches	<p>Key Specifications:</p> <ul style="list-style-type: none"> <li>Switching Fabric: The core component determining forwarding speed and capacity, commonly based on Ethernet or Fibre Channel.</li> <li>Port Density: The number of available network ports for device connections.</li> <li>Switching Latency: The time required to forward a packet from input to output port, measured in microseconds or nanoseconds.</li> <li>Forwarding Modes: Store-and-forward, cut-through, or fragment-free, each with different latency and error-handling characteristics.</li> <li>VLAN Support: The ability to create virtual LANs for segmentation and traffic isolation.</li> <li>Security Features: Access control lists (ACLs), port security, and other security measures to protect the network.</li> </ul>	30
3.	Intrusion Prevention Systems	<p>McAfee Endpoint Security:</p> <ul style="list-style-type: none"> <li>Features: Offers network intrusion prevention alongside endpoint protection, firewall, application control, and device control.</li> <li>Technical Specifications: Supports Windows, macOS, Linux, and Android devices.</li> <li>Pricing: Varies depending on the chosen plan and number of devices protected.</li> </ul> <p>2. McAfee Network Security Platform:</p> <ul style="list-style-type: none"> <li>Features: Provides network intrusion prevention for on-premises, cloud, and hybrid environments, along with other network security functions like firewall, web filtering, and malware protection.</li> </ul>	1

		<p>Technical Specifications: Supports various network devices and operating systems.                      Pricing: Contact McAfee for a quote.                      3. McAfee Total Protection:</p> <p>Features: Combines endpoint protection, network intrusion prevention, firewall, and identity theft protection for home users.                      Technical Specifications: Supports Windows, macOS, Android, and iOS devices.</p>	
4.	NOC Network Monitoring Software – Pre installed in Laptop/Desktop	<p>Capabilities:</p> <p>End-to-End Visibility: Monitors network traffic between services, containers, hosts, Kubernetes pods, and any other relevant endpoints.                      Application-Layer Insights: Aggregates connection data at the IP, port, and PID levels into application-layer dependencies for easier analysis.                      Multi-Cloud Support: Works seamlessly across various cloud providers like AWS, Azure, GCP, and Alibaba Cloud.                      Flow Data Analysis: Analyzes flow data alongside key network traffic and DNS server metrics for troubleshooting.                      Performance Optimization: Helps identify and optimize costly cross-regional or multi-cloud communication.                      Dependency Identification: Uncovers unexpected or latent service dependencies that might impact performance.                      Network Health Monitoring: Monitors the health of individual network devices and detects anomalies in bandwidth utilization.                      Proactive Troubleshooting: Enables proactive identification of network-related issues before they affect applications or users.                      Customizable Visualization: Offers customizable network pages and network maps for intuitive data exploration.                      Integration with other Datadog Tools: Integrates with other Datadog products for unified monitoring of infrastructure, applications, and user experience.</p> <p>Technical Specifications:</p> <p>Operating Systems: Supported on Linux, Windows, and containerized environments (Docker, Kubernetes) with Istio service mesh support.                      Data Collection: Utilizes eBPF technology for efficient and lightweight data collection with minimal performance impact.                      Deployment: Agent-based deployment on individual hosts or containers.                      Data Storage: Data is stored and visualized in the Datadog cloud platform.</p>	1
5.	Trainer Guide	<p>Dimensions:</p> <p>21.0 x 29.7 cm</p> <p>Pages 250</p>	1

6.	Whiteboard	Dimensions: These whiteboards are typically large, often spanning entire walls in NOCs to visualize network diagrams, performance metrics, and troubleshooting information. Common sizes range from 4 meters x 3 meters to 6 meters x 4 meters or even larger. Specifications: They utilize specialized surfaces like writable glass, melamine, or high-performance dry-erase paint for optimal clarity and durability. Some advanced whiteboards might even incorporate digital projection capabilities for interactive displays.	1
7.	Marker	Dry erase markers: These markers are used for writing on whiteboards and other dry erase surfaces. They have a chisel tip and come in a variety of colors. Some popular dry erase marker b	6
8.	Projector	BenQ TH585: This Full HD projector is great for both home and office use. It has a brightness of 3500 lumens, a contrast ratio of 10000:1, and a throw ratio of 1.47:1. It also has built-in speakers and supports wireless connectivity. The dimensions are 292 x 222 x 122 mm	1
9.	Laptop	Display: 13.4-inch InfinityEdge Full HD (1920 x 1080) display Processor: 11th Gen Intel Core i5-1130G7 processor Memory: 16GB LPDDR4x RAM Storage: 512GB PCIe NVMe SSD Graphics: Intel Iris Xe integrated graphics Battery: Up to 14 hours and 48 minutes of battery life (Mobile Mark 2018) Operating system: Windows 11 Home	1
10.	Breadboard	Features: 630 tie point terminal strip, 2 distribution strips 200 points, both side have slot, supoort joining together.Solderless breadboard is easy to use for creating temporary prototypes and experimenting with circuit design.With referencing letters printed on side for easy reference of individual holes.Double side adhesive tape back, it is more easy and convenient to use.Interconnect any components with 26-29 Awg(0.3-0.8mm) wire.	120
11.	Multimeter	Material: Bronze, Plastic Display Type: LCD Resistance: 200 Ohm, 2 K Ohm, 2 M Ohm	2
12.	Resistors	Tolerance: 5% Power Rating(W): 1/4 Watt Mounting Type: Through-hole (PTH) Type: Carbon Film (CFR)	1
13.	Capacitors	2PCS OF 4700UF/25V ELECTROLYTIC CAPACITOR	2
14.	Inductors	Material: Core Ferrite Inductance: 220μH Tolerance: ±20% Current Rating (Amps): 2.4A Shielding: Unshielded Operating Temperature: -40°C ~ 105°C Mounting Type: Through-Hole Package/Case: Radial, Vertical (Open) Dimensions (D x W): (14mm x 7.45mm)	5
15.	Jumper Wires	40P colored jumper wires Length: 200mm	6

		Weight: 30 gm Compatible with 2.54mm spacing pin headers High quality and in good working condition Durable and reusable	
16.	Generator	AK POWER SERVICE The ALPHA A3600 generator delivers POWER, when you need it. It provides 3,000 watts of starting power and 2,800 watts of running power. The size and power output make the ALPHA A3600 the perfect generator for construction sites or back-up power for your home during emergencies. This 3000-Watt generator features a Single-Cylinder, 4-Stroke, Air-Cooled, OHV Self start Engine designed to provide 3000W/50Hz-Starting Watts and 2800W/50Hz-Running Watts. The generator provides an 9-Hour Runtime Depending on load. Engine Oil Type is 10W-30 / 10W-40 / 15W-30 / 15W-40 non-synthetic engine oil and Engine output is 7hp/3000rpm. Specification of this engine is that 240v AC, power factor:1, Fuel Tank Capacity: 15L, Oil Type: SAE 10W30, Oil Capacity: 600ml, Product Weight: 48kg and Carton Weight: 50kg	1
17.	Oscilloscope	Bandwidth of 1 GHz or higher are preferred Oscilloscopes with a sample rate of 2 GSa/s (gigasamples per second) or more are recommended Precise triggering capabilities Memory depth of 1 million points or more is desirable to analyze long bursts of data or capture transient events Price: ₹ 1.5 Lakhs - ₹ 5 Lakhs	1
18.	Potentiometers	<ul style="list-style-type: none"> <li>• Tolerance: <math>\pm 25\%</math></li> <li>• Power rating: .1W @ 70°C max.</li> <li>• Rotation torque: 15~170gcm.</li> </ul>	6
19.	Transistors	Model Number: BC 547 & BC 557 transistor pack of 20 pcs each Package Type: Plastic Package Type Power Consumption: 5 mW Maximum Collector Current: 1 A Maximum Collector Emitter Voltage: 25 V Mount Type: Top DC Current Gain: 50 Maximum Operating Frequency: 100 MHz Number of Pins: 3	6
20.	Diodes	Low forward voltage drop High current capability High reliability High surge current capability Package included - 100Pcs 1N4007 Diode 1A 1000V Rectifier Diodes	120
21.	Circuit Simulation Software	Capabilities: Block-based modeling: Utilizes drag-and-drop blocks to represent system components and connections, making it intuitive for visual learners. Wide range of libraries: Includes extensive libraries for modeling physical systems, electrical circuits, power systems, signal processing, and more. Integration with MATLAB: Seamlessly integrates with MATLAB for data analysis, visualization, and script-based control. Customization: Allows custom block creation for specific needs and modeling complex components.	1

		<p>Simulation: Offers various simulation algorithms and options for time-domain, frequency-domain, and multi-rate simulations.</p> <p>Code generation: Can generate C/C++ and HDL code for hardware implementation of designed systems.</p> <p>Verification and validation: Supports testing and verification of system models through tools like Simulink Design Verifier and Requirements Toolbox.</p> <p>Technical Specifications:</p> <p>Supported platforms: Windows, macOS, and Linux.</p> <p>System requirements: Processor (minimum: dual-core, recommended: quad-core with AVX2 support), RAM (minimum: 4GB, recommended: 8GB or more), Disk space (varies depending on libraries and models).</p> <p>Licensing: Offered through individual licenses, academic licenses, and volume licensing options.</p>	
22.	Voltage Regulator	<p>Fixed output voltage is 5V</p> <p>Output current is 0.5A</p> <p>Dropout voltage is 2V</p> <p>Maximum DC input voltage is 35V</p> <p>Output transition SOA protection</p> <p>Output voltage tolerance is 4%</p> <p>Operating temperature range 0°C to 125°C</p> <p>Applications: Power Management.</p>	6
23.	Grounding electrode	<p>Material Copper, Low Carbon Steel</p> <p>Brand Generic</p> <p>Item Dimensions LxWxH 20 x 20 x 580 Millimeters</p> <p>Shape Cylindrical</p> <p>Item Form Rod</p> <p>Base Material - Low Carbon Steel</p> <p>Base Coating Material - Nickel</p> <p>Coating Material - 99.9% Pure Electrolytic Grade Copper Anode</p> <p>Coating Thickness - 100 Microns</p> <p>Diameter(mm) - 14mm</p> <p>Connectors - SS 304 Grade Nut Bolts</p> <p>Good Corrosion Resistance than Cast Iron/ Hot Dip GI Electrodes</p>	6
24.	Clamp Meter	<p>Power Source Battery Powered</p> <p>Style Digital</p> <p>Colour Black</p> <p>Item Weight 760 Grams</p> <p>Jaw Size: 50 millimeter or 2.0 inch</p> <p>Tests AC or DC voltage, AC current and resistance</p> <p>Diode check and continuity test</p>	6

25.	Earth Tester	Dual Ranges (a) 0 - 10 - 1000 OHM Technical Details Display : 3½ Digits, LCD Dimensions (in mm) : 172 x 98 x 38 (Approx.) Weight : 575 gm (Approx.)	1
26.	RF Meter	SKU: TES.INS.19189908 Type of Product: Electromagnetic Radiation Tester Display: 3-1/2 Digits LCD Operating Temperature: 0°C - 50°C Relative Humidity: <80%RH Input Power: 6F22 9V Battery Weight: 146 g Dimensions (L x W X H) (mm): 63.6 x 31 x 125.8 mm Voltage: 9 V Measurement Range: 1V/m-1999V/m Model No: R-EMR	6
27.	Safety Equipment	Gloves: Types: Work gloves, cut-resistant gloves, chemical-resistant gloves. Specifications: Vary depending on type and intended use. protection. Description: Cover and protect hands from cuts, abrasions, chemicals, heat, cold, and electrical hazards.  Safety Goggles: Types: Chemical splash goggles, impact-resistant goggles Specifications: ANSI Z87.1 safety rating for impact resistance, . Description: Shield eyes from flying debris, chemicals, splashes, harmful radiation, and optical hazards.  Ear Protection: Types: Earplugs, earmuffs, canal caps, etc. Specifications: NRR (Noise Reduction Rating) of 25dB. Description: Reduce noise exposure and prevent hearing damage from loud machinery, tools, and other noise sources.	30
28.	Ammeters	Model Number: 72 MM Type: Moving Iron Ammeters Power Source: AC Measuring Range: 0-30 A Measurement Accuracy: 2.5 A Width: 2.5 cm Length: 4 cm Weight: 100 g	6
29.	Filter Capacitors	ECCN (US): EAR99 Part Status: Active HTS: 8548.90.01.00 Capacitance Value: 220pF	2

		Tolerance: 20% Voltage: 50VDC IR (mA): 700 Minimum Insulation Resistance (Ohm): 1G Construction: Flat Mounting: Surface Mount Package/Case: 0805 Minimum Operating Temperature (°C): -55 Maximum Operating Temperature (°C): 125 Product Length (mm): 2 Product Depth (mm): 1.25 Product Height (mm): 0.85 Product Weight (g): 0.012	
30.	Inverter	inverters: These are typically used for powering small appliances and electronics, and they can be as small as a shoebox (around 12 x 8 x 6 inches).	2
31.	Compatible batteries	Width 52 cm Height 28.2 cm Depth 27.5 cm Battery Weight - Dry 27.6 Battery Weight - Wet 51.3 kg	2
32.	Safety signage	Small UPS systems: These are designed for home use or small businesses and typically have dimensions around 10-12 inches tall, 6-8 inches wide, and 12-14 inches deep.	1
33.	measuring tape	Length: Measuring tapes typically range in length from 3 meters (10 feet) to 50 meters (164 feet)	1
34.	markers	Dry erase markers: These markers are used for writing on whiteboards and other dry erase surfaces. They have a chisel tip and come in a variety of colors. Some popular dry erase marker b	120
35.	screws	1/4 inch in diameter and 1 inch long would be referred to as a "1/4-20 x 1 inch" screw	1
36.	Multimeter	Material: Bronze, Plastic Display Type: LCD Resistance: 200 Ohm, 2 K Ohm, 2 M Ohm	1
37.	Electronic Load Simulator	Benchtop models: These are typically larger and more powerful, with dimensions ranging from 10 x 18 x 30 cm to 20 x 30 x 45 cm (LxWxH). Handheld models: These are smaller and more portable, with dimensions around 5 x 10 x 15 cm (LxWxH)	5
38.	Inspection mirror	Diameter: Ranges from around 25 millimeters to 115 millimeters (1 to 4.5 inches) Length: Telescoping mirrors can extend from around 120 millimeters to 760 millimeters (5 to 30 inches)	2

39.	Flashlight	Mini flashlights: These are the smallest and most portable flashlights, typically measuring around 2-3 inches in length and 1 inch in diameter. They are perfect for everyday carry (EDC) or keychain attachment.	1
40.	Magnifying glass	Dimensions: Magnifying glasses typically range in size from small, pocket-sized options with a lens diameter of around 20mm to large, handheld magnifiers with a lens diameter of 100mm or more.	1
41.	Screwdrivers	6.0x0.8mm Two In One Screw Driver, 907, Blade Length: 200 mm Accurately hardened & Tempered to 56-60 HRC. To withstand high torque and high wear resistance properties	1
42.	Pliers	Product Dimensions: 18L x 5W Centimeters Handle Material: Rubber	1
43.	Wrenches		1
44.	Wire brush		1
45.	Dielectric grease		1
46.	Circuit breaker		120
47.	Fuses		
48.	Insulation resistance tester		1
49.	Labeling tools		1
50.	Surge protection devices		1
51.	Transformers		30
52.	Switchgear		6
53.	Safety labels and signage		4
54.	Insulation Resistance Testers		120
55.	Cable Testers		4
56.	Lockout/Tagout Kits		2
57.	Lightning Arrestors		2
58.	Power Distribution Equipment		5
59.	Backup Power Systems		6

60.	Grounding Systems		6
61.	Generators	Power output (kW), fuel type, starting method	6
62.	Screwdrivers	6.0x0.8mm Two In One Screw Driver, 907, Blade Length: 200 mm Accurately hardened & Tempered to 56-60 HRC. To withstand high torque and high wear resistance properties	6
63.	Bolts and Nuts	Generic	6
64.	Mounting Brackets	L-Brackets: These are the most common with one side longer than the other, forming an L-shape. They are highly versatile for various mounting applications.	6
65.	Pipes (Fuel Lines)		6
66.	Safety Valves		6
67.	Infrared Thermometer	Non Contact and Accurate Readings : Non-contact infrared measurement. Measuring distance is under 1-2inch, while avoiding cross infection. The forehead thermometer medical has been clinically tested, and has a very small error margin. It is actually more accurate and healthier than standard mercury thermometers. Sound Alarm : High-accuracy infrared measurement, when the temperature is over, audible alert will trigger. The HD LED screen displays clear and crisp numbers that are easy to read. Multi-Purposes : The Forehead thermometer is designed for all ages: adults, infants and elders. It support to take human temperature. Memory Feature : It can store up to 32 temperature readings and recall them at any time. This comes in handy for keeping a record, and makes it convenient for babies, children, adults. Also it has auto shutdown feature for power saving. For warranty or service issues kindly contact brand support	6
68.	Fuel Flow Meter		1
69.	Power quality monitoring equipment	<ul style="list-style-type: none"> <li>• Tolerance: <math>\pm 25\%</math></li> <li>• Power rating: .1W @ 70°C max.</li> <li>• Rotation torque: 15~170gfcM.</li> </ul>	1
70.	Voltage stabilizers	Fixed output voltage is 5V Output current is 0.5A Dropout voltage is 2V Maximum DC input voltage is 35V Output transition SOA protection Output voltage tolerance is 4% Operating temperature range 0°C to 125°C Applications: Power Management.	1
71.	Regulators	ATX Power Supplies (Desktop Computers): These are the most common. Standard ATX power supplies are around 150mm x 150mm x 86mm. However, high-power ATX supplies can be longer.	2
72.	Cable Tester	Dual Ranges (a) 0 - 10 - 1000 OHM Technical Details Display : 3½ Digits, LCD Dimensions (in mm) : 172 x 98 x 38 (Approx.) Weight : 575 gm (Approx.)	6

73.	Firewalls	Firewalls: Specifications: Control traffic flow between trusted and untrusted networks, filtering and blocking unauthorized access.	6
74.	Access Controls		2

### Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Projector
2. Computer/laptops
3. Internet connectivity

NSQC Approved

## Annexure: Industry Validations Summary

Provide the summary information of all the industry validations in table. This is not required for OEM qualifications.

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile (if available)
1.	ATL Advisor	Malar	Managing Partner	F-12, DS-IV, Uttarpan, MCC, Ultadanga, Kolkata-700054	9830803100/9073621498	<a href="mailto:atlfm.co@gmail.com">atlfm.co@gmail.com</a>	
2.	Dipti Consultancy Pvt.Ltd.	Ambar Shome	HR Head	EC-48, Ghosh Para, PO – Desh Bandhu Nagar, PS – Rajarhat, 24 Parganas (N), Kolkata, West Bengal India-- 700059	9874641344	<a href="mailto:subhro@pkfc.in">subhro@pkfc.in</a>	
3.	Dreamz Tech Solutions	Kaushiki Mazumder	Recruitment Lead	AQ-7, 6th floor, Ambient Building, Sector V, Saltlake city, Kolkata 700091	033-40040627	<a href="mailto:marketing@dreamztech.com">marketing@dreamztech.com</a>	
4.	Global Digital Care	Sudip Roy	Founder	AB-189, Salt Lake, Sector -1, Kolkata-700064	9831595105	<a href="mailto:globaldigitalcare@gmail.com">globaldigitalcare@gmail.com</a>	
5.	Senrysa Technologies Pvt.Ltd.	Triparna Mukherjee	HR – Business Partner & Leadership Acquisition	#601,Godrej Waterside, Tower -1, DP block, Saltlake, Sector V, Kolkata-700091	033-66212222	<a href="mailto:mail@senrysa.com">mail@senrysa.com</a>	
6.	Vipanan Management Services unit of global digital care	Sudip Roy	Founder	10th Floor. Tower B, Unitech Cyber Park, Sector -39, Gurgaon, India - 122003	9831595105	<a href="mailto:vipananmanagementservices@gmail.com">vipananmanagementservices@gmail.com</a>	
7.	RETROFIT TECHNOLOGY PVT LTD	Raj Kishore Raj	Director	Pallavi Palace, Buer Jail Road, Above Indian Bank ATM, Anisabad, Patna	7283080808	<a href="mailto:rajkishore_raj@hotmail.com">rajkishore_raj@hotmail.com</a>	
8.	Brightwell Engineers	M.Sandeep	Electrical supervisor	206/207, Konark Indrayu Mall, Kondhwa (Kh), Pune - 411048	7020646560	<a href="mailto:brightwellgroupofeng@gmail.com">brightwellgroupofeng@gmail.com</a>	
9.	Apar Infratel pvt ltd	Sunil Prasad	Coordinator	Plot no. 71, Raksha Enclave Mohan Garden, Uttam Nagar, Near Chat Ghat, New Delhi, West Delhi India - 110059	8240768869	<a href="mailto:aparinfratel@aparinfratel.in">aparinfratel@aparinfratel.in</a>	
10.	Greentech Infratel Private limited	Ashish Solanki	Project Manager	296/3/1, GROUND FLOOR, PORWAL ROAD, LOHEGAON, PUNE, Maharashtra, 411047	7030341414	<a href="mailto:ashish.solanki87@gmail.com">ashish.solanki87@gmail.com</a>	
11.	M.S Contractor	Manjeet	Electrical supervisor	Jani Khurd, Meerut 250501 (U.P)	9911067269	<a href="mailto:mscontractor.sidq@gmail.com">mscontractor.sidq@gmail.com</a>	
12.	Ocean Blue Infra Solutions Pvt Ltd.	KAPIL	Electrical supervisor	A-49, Ramayan South Avenue, Phase-2, Katara Hills, Bhopal, MP-462043	9340317312	<a href="mailto:oceanblueinfra@obtl.in">oceanblueinfra@obtl.in</a>	
13.	Om Sai Associates	Om Prakash	Supervisor	(B2/5 2nd Floor, Shiwangi tower, Vibhuti Khand, Gomti Nagar, Lucknow – 226010 (UP)	9450440316/9794671111 /7007946683	<a href="mailto:omsaiassociatesgkp@gmail.com">omsaiassociatesgkp@gmail.com</a>	
14.	Parin Electric Corporation	Sandeep Kushavah	Coordinator	S/22-23, Sarthi Complex, Near Ashirwad Hotel, Jashoda Cross Road, Jashodanagar, Ahmedabad-382445, Gujarat	9723454184	<a href="mailto:sk144507@gmail.com">sk144507@gmail.com</a>	
15.	R.S. Construction	Jitendra Kumar Chourasia	Director	Bishunpur, P.O-Gomoh, Dist-Dhanbad, Jharkhand - 828401	8757770898	<a href="mailto:rsconstruction0000@gmail.com">rsconstruction0000@gmail.com</a>	
16.	Radha Krishan Contractor	Sanjeev Kumar	Coordinator	89-2-3/2-1, Opp. HPCL Petrol Bunk Road, Beside Airtel Tower, Morampudi, Rajahmundry - 533107	8886661228	<a href="mailto:project@radhakrishancontractor.in">project@radhakrishancontractor.in</a>	
17.	Steelman Telecom Limited	Nirmal	HR	Rishi Tower, Premises No. 02-315, Street No. 315, First Floor, New Town, Kolkata - 700156	9311911490	<a href="mailto:nirmalendu.sarkar@steelmantelecom.com">nirmalendu.sarkar@steelmantelecom.com</a>	

18.	Sumit Enterprises & Fabrication	Mahaling Prabhu Raut	Proprietor	1457/1, AKATE COLONY, MEHETRE VASTI, CHIKHALI, Pune, Maharashtra, 411014, PUNE , Pune , 411014	7020177942	<a href="mailto:mahalingmali1191@gmail.com">mahalingmali1191@gmail.com</a> <a href="mailto:mahalingmali1191@gmail.com">mahalingmali1191@gmail.com</a>
19.	AKS Techno	Manoj Choudhary	Supervisor	175, HANSA INDUSTRIAL PARK, DERBASSI-140 507. MOHALI PB	8789514246	<a href="mailto:manoj.chaudhary@akstechno.com">manoj.chaudhary@akstechno.com</a>
20.	Aleem Enterprises	Ramesh	Supervisor	B-102, Taibah Residency, Opp. Amber Tower, Sarkhej, Ahmedabad - 380055	9940939980/9549015190	<a href="mailto:aleem.khan@aleementerprises.com">aleem.khan@aleementerprises.com</a>
21.	HKB Rahman Constructions	Bahar Hussain Beg	Director	G-250, Indralok Colony, Krishna Nagar, Lucknow - 226023	9598073740/9889639786	HKB Rahman Constructions
22.	Infratech constructions	D.R. Arote	Supervisor	Rakshak Nagar Gold, S.No. 4/1/2 Bi-B1, Kharadi Pune - 411014	9373332644	<a href="mailto:arote.infratech@gmail.com">arote.infratech@gmail.com</a>
23.	Infytel Corporation	Kounik Chakraborty	Director	Webel IT Park (Ph-1), Module 213, DH Block, (Newtown), Action Area 1, Newtown, North 24 Pgs, Pin: 700156	6290440066	<a href="mailto:kounik.chakraborty@infytel.co.in">kounik.chakraborty@infytel.co.in</a>
24.	Perfect Power System	Chandan	Supervisor	4th Floor, Krishna Building, S.P. Verma Road, Patna- 800001	9038012039/8873035800/8873035801	<a href="mailto:chandan.das@telepower.in">chandan.das@telepower.in</a> <a href="mailto:info@perfectpowersystem.com">info@perfectpowersystem.com</a>
25.	Prabhat Construction & Fabricators	Vikram	Supervisor	153, Mitar Nagar, Jhotwara, Jaipur, Rajasthan-302012	9887428142/9928329678/8696329678	<a href="mailto:mis.project@prabhatconstruction.com">mis.project@prabhatconstruction.com</a> <a href="mailto:prabhatconstruction@yahoo.com">prabhatconstruction@yahoo.com</a> <a href="mailto:bhanwarlaljpr1@yahoo.in">bhanwarlaljpr1@yahoo.in</a>
26.	Saumya Infraspace	Mukesh Yadav	Supervisor	1208, Swati Crimson and clover, Nr, Shilaj Circle, Ahmedabad, 380059, Gujarat	7435807507	<a href="mailto:projects@saumyainfraspace.in">projects@saumyainfraspace.in</a>
27.	Secured Security Solutions Pvt.Ltd	Ashim Mandal	Director	47/1B , Bose Pukur, KasbaKolkata (W.B)India	0771 – 4287200	<a href="mailto:info@securedsecuritysolutions.com">info@securedsecuritysolutions.com</a>
28.	Smart Project	Jafar	Supervisor	235/99, Doctor's Lane, Rohra Plaza, 1st Floor, Room no-164, JC Ghosh Sarani, Chinsurah, Hooghly-712101	9830045838	<a href="mailto:info@smartproject.co.in">info@smartproject.co.in</a>
29.	Tele Power	Jyotirmoy Saha	Director	126, KM Roy Chowdhury Road, Rajpur,24 PGS (S), Kol-700151	9073538374	<a href="mailto:jyotirmoy.saha@telepower.in">jyotirmoy.saha@telepower.in</a>
30.	AQUINT Global Techskill India Pvt Ltd	Nirav Mehta	HOD Training and Placement	1312, Fortune Business Hub, Near Science City, Science City Road, Ahmedabad-380060	8200695636	<a href="mailto:contact@aquint.com">contact@aquint.com</a>

### Annexure: Training & Employment Details

#### Training and Employment Projections:

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
23-24	5400	3500	1000	700	00	00
24-25	7000	5000	3000	1500	00	00
25-26	10000	8000	4000	2500	00	00

Data to be provided year-wise for next 3 years

Training, Assessment, Certification, and Placement Data for previous versions of qualifications: NA

Qualification Version	Year	Total Candidates				Women				People with Disability			
		Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed

Applicable for revised qualifications only, data to be provided year-wise for past 3 years.

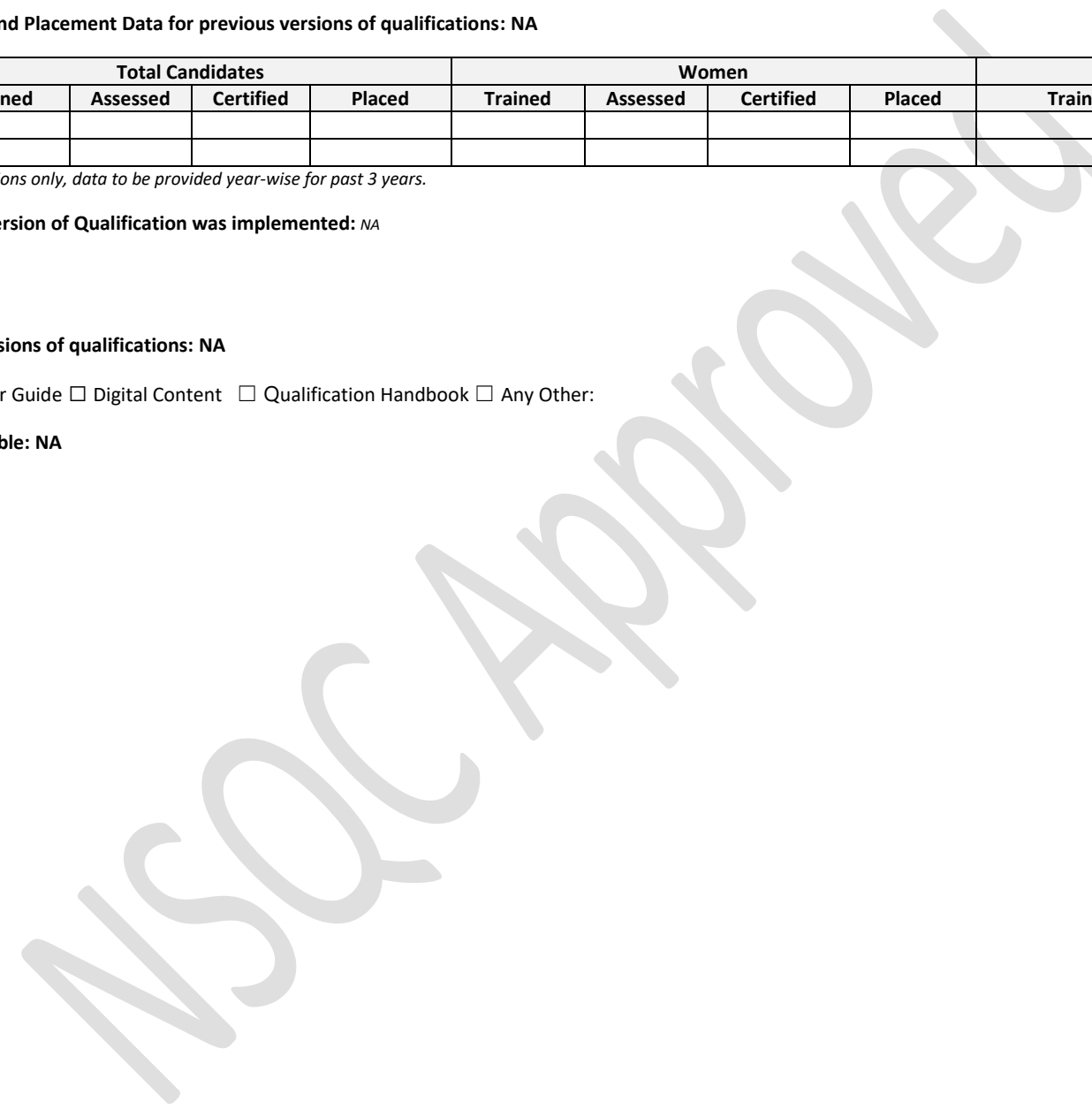
List Schemes in which the previous version of Qualification was implemented: NA

- 1.
- 2.

Content availability for previous versions of qualifications: NA

Participant Handbook  Facilitator Guide  Digital Content  Qualification Handbook  Any Other:

Languages in which Content is available: NA



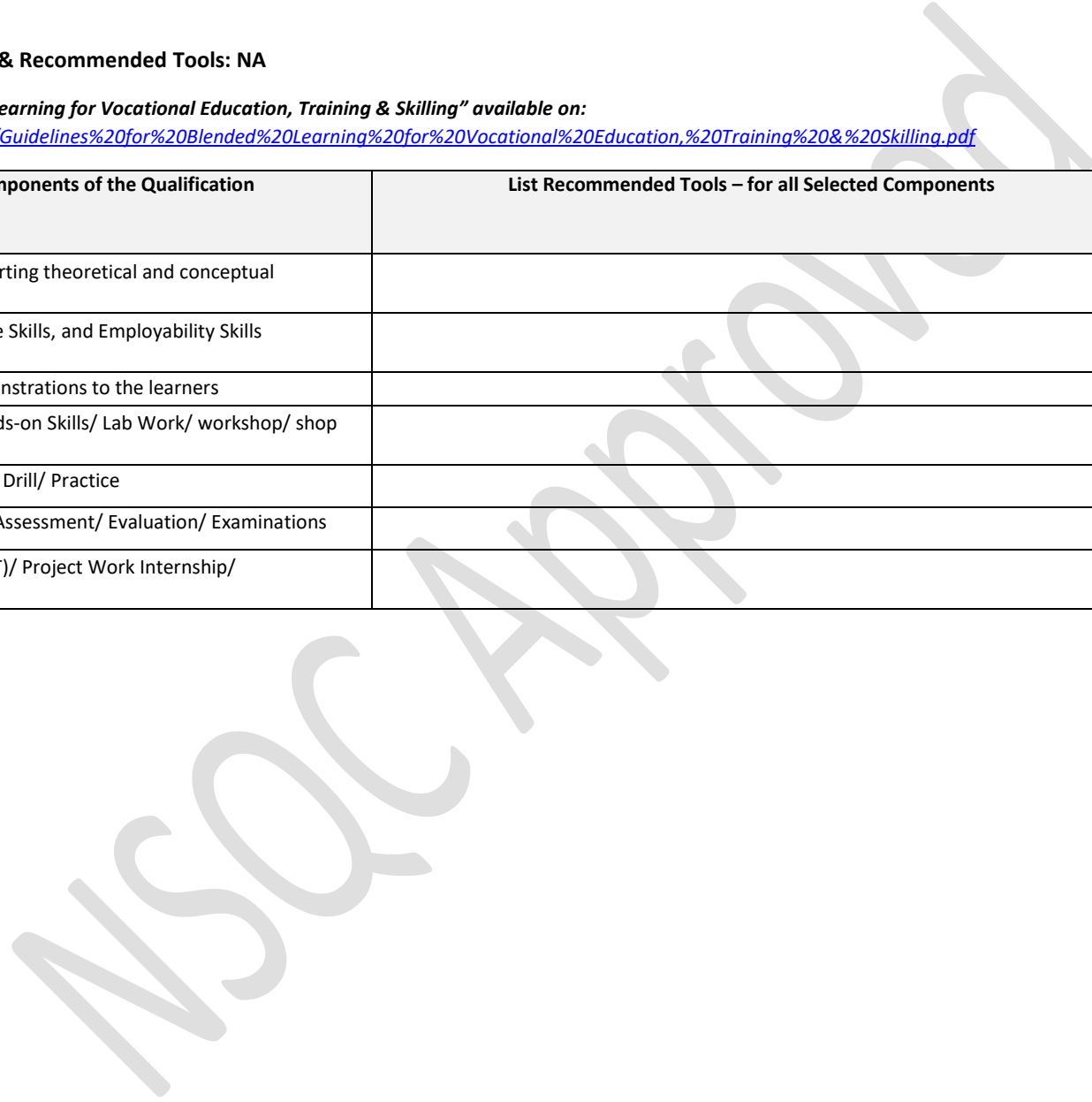
## Annexure: Blended Learning

### Blended Learning Estimated Ratio & Recommended Tools: NA

Refer NCVET “Guidelines for Blended Learning for Vocational Education, Training & Skilling” available on:

<https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf>

S. No.	Select the Components of the Qualification	List Recommended Tools – for all Selected Components	Offline : Online Ratio
1	<input type="checkbox"/> Theory/ Lectures - Imparting theoretical and conceptual knowledge		
2	<input type="checkbox"/> Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		
3	<input type="checkbox"/> Showing Practical Demonstrations to the learners		
4	<input type="checkbox"/> Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		
5	<input type="checkbox"/> Tutorials/ Assignments/ Drill/ Practice		
6	<input type="checkbox"/> Proctored Monitoring/ Assessment/ Evaluation/ Examinations		
7	<input type="checkbox"/> On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training		



### Annexure: Detailed Assessment Criteria

Detailed assessment criteria for each NOS/Module are as follows:

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>TEL/N4301: Install and Maintain Inverter and Battery Banks</b>	<i>Inverter and Battery Banks</i>	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
	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	-	-
	<i>Battery Technology</i>	<b>15</b>	<b>20</b>	-	<b>4</b>
	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
	<b>Total Marks</b>	<b>40</b>	<b>50</b>	<b>-</b>	<b>10</b>
	<i>One-Phase Electrical Systems</i>	<b>24</b>	<b>30</b>	<b>-</b>	<b>7</b>
<b>TEL/N4302: Design and Install One-Phase and Three-Phase Electrical Systems at cell site</b>	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
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	-	-
<i>Three-Phase Electrical Systems</i>	<b>16</b>	<b>20</b>	-	<b>3</b>
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	-	-
	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	-	-
	<b>Total Marks</b>	<b>40</b>	<b>50</b>	<b>-</b>	<b>10</b>
	<i>Electrical Components in Telecom Systems</i>	<b>15</b>	<b>20</b>	<b>-</b>	<b>4</b>
<b>TEL/N4303: Install, Maintain, and Troubleshoot Electrical Components</b>	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	-	-
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	-	-
<i>Generators</i>	<b>15</b>	<b>19</b>	-	<b>3</b>
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	-	-
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	-	-	-
	<i>Air Conditioners</i>	<b>10</b>	<b>11</b>	-	<b>3</b>
	PC39. ensure that the installation location complies with safety and environmental regulations	1	-	-	-
	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	-	-
	<b>Total Marks</b>	<b>40</b>	<b>50</b>	<b>-</b>	<b>10</b>
<b>TEL/N4304: Upgrade electrical systems to meet capacity and power quality requirements</b>	<i>Electrical Distribution Systems and Power Quality</i>	<b>15</b>	<b>20</b>	<b>-</b>	<b>3</b>
	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
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	-	-
<i>Electrical Testing and Troubleshooting</i>	<b>10</b>	<b>20</b>	-	<b>3</b>
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
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	-	-
<i>Electrical Maintenance and Upgrade</i>	<b>15</b>	<b>10</b>	-	<b>4</b>
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
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	-	-
	<b>Total Marks</b>	<b>40</b>	<b>50</b>	<b>-</b>	<b>10</b>
	<i>Electrical Protection Systems</i>	<b>20</b>	<b>25</b>	<b>-</b>	<b>4</b>
<b>TEL/N4305: Develop and implement telecom electrical standards</b>	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
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	-	-
<i>Network Infrastructure and Cable Installation</i>	<b>20</b>	<b>25</b>	-	<b>6</b>
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	-	-

	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	-	-
	<b>Total Marks</b>	<b>40</b>	<b>50</b>	<b>-</b>	<b>10</b>
<b>TEL/N9101: Organize Work and Resources as per Health and Safety Standards</b>	<i>Perform work as per quality standards</i>	<b>4</b>	<b>9</b>	<b>-</b>	<b>2</b>
	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	-	-
<i>Maintain safe, healthy and secure working environment</i>	<b>16</b>	<b>27</b>	-	<b>4</b>
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	-	-
PC13. participate regularly in fire drills or other safety related workshops organized 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	-	-
	<i>Conserve material/energy/electricity</i>	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	-	-
	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	-	-
	<i>Use effective waste management/recycling practices</i>	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	-	-
	<b>Total Marks</b>	<b>30</b>	<b>60</b>	<b>-</b>	<b>10</b>
<b>DGT/VSQ/N0102: Employability Skills (60 Hours)</b>	<i>Introduction to Employability Skills</i>	1	1	-	-
	PC1. identify employability skills required for jobs in various industries	-	-	-	-
	PC2. identify and explore learning and employability portals	-	-	-	-
	<i>Constitutional values – Citizenship</i>	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	-	-	-	-
	<i>Becoming a Professional in the 21st Century</i>	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	-	-	-	-
<i>Basic English Skills</i>	<b>2</b>	<b>3</b>	-	-
<b>PC7.</b> use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
<b>PC8.</b> read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
<b>PC9.</b> write short messages, notes, letters, e-mails etc. in English	-	-	-	-
<i>Career Development &amp; Goal Setting</i>	<b>1</b>	<b>2</b>	-	-
<b>PC10.</b> understand the difference between job and career	-	-	-	-
<b>PC11.</b> prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
<i>Communication Skills</i>	<b>2</b>	<b>2</b>	-	-
<b>PC12.</b> follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
<b>PC13.</b> work collaboratively with others in a team	-	-	-	-
<i>Diversity &amp; Inclusion</i>	<b>1</b>	<b>2</b>	-	-
<b>PC14.</b> communicate and behave appropriately with all genders and PwD	-	-	-	-
<b>PC15.</b> escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	<b>2</b>	<b>3</b>	-	-
<b>PC16.</b> select financial institutions, products and services as per requirement	-	-	-	-
<b>PC17.</b> carry out offline and online financial transactions, safely and securely	-	-	-	-
<b>PC18.</b> identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
<b>PC19.</b> identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	<b>3</b>	<b>4</b>	-	-
<b>PC20.</b> 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	-	-	-	-
<i>Entrepreneurship</i>	<b>2</b>	<b>3</b>	-	-
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	-	-	-	-
<i>Customer Service</i>	<b>1</b>	<b>2</b>	-	-
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	-	-	-	-
<i>Getting ready for apprenticeship &amp; Jobs</i>	<b>2</b>	<b>3</b>	-	-
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	-	-	-	-
<b>Total Marks</b>	<b>20</b>	<b>30</b>	-	-
<b>Grand Total</b>	<b>250</b>	<b>340</b>	-	<b>60</b>

## Annexure: Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

*Mention the detailed assessment strategy in the provided template.*

- a. Assessment System Overview:
  - i. Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email.
  - ii. Assessment agencies send the assessment confirmation to VTP/TC looping SSC.
  - iii. The assessment agency deploys the ToA certified Assessor for executing the assessment.
  - iv. SSC monitors the assessment process & records.
  
- b. Testing Environment:
  - i. Confirm that the centre is available at the same address as mentioned on SDMS or SIP.
  - ii. Check the duration of the training.
  - iii. Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
  - iv. If the batch size is more than 30, then there should be 2 Assessors.
  - v. Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
  - vi. Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
  - vii. Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
  - viii. Check the availability of the Lab Equipment for the particular Job Role.
  
- c. Assessment Quality Assurance levels / Framework:
  - i. Question papers created by the Subject Matter Experts (SME).
  - ii. Question papers created by the SME verified by the other subject Matter Experts.
  - iii. Questions are mapped with NOS and PC.
  - iv. Question papers are prepared considering that level 1 to 3 is for the unskilled & semi- skilled individuals, and level 4 and above are for the skilled, supervisor & higher management.
  - v. An assessor must be ToA certified & the trainer must be ToT Certified.
  - vi. The assessment agency must follow the assessment guidelines to conduct the assessment.

- d. Types of evidence or evidence-gathering protocol:
  - i. Time-stamped & geotagged reporting of the assessor from assessment location.
  - ii. Center photographs with signboards and scheme-specific branding.
  - iii. Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period.
  - iv. Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos.
  
- e. Method of verification or validation:
  - i. A surprise visit to the assessment location.
  - ii. A random audit of the batch.
  - iii. Random audit of any candidate.
  
- f. Method for assessment documentation, archiving, and access:
  - i. Hard copies of the documents are stored.
  - ii. Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage.
  - iii. 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.

NSQC Approved

## Annexure: Acronym and Glossary

### Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
OJT	On the Job Training

### Glossary

Term	Description
<b>National Occupational Standards (NOS)</b>	NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
<b>Qualification</b>	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
<b>Qualification File</b>	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
<b>Sector</b>	A grouping of professional activities on the basis of their main economic function, product, service or technology.
<b>Long Term Training</b>	Long-term skilling means any vocational training program undertaken for a year and above. <a href="https://ncvet.gov.in/sites/default/files/NCVET.pdf">https://ncvet.gov.in/sites/default/files/NCVET.pdf</a>