QUALIFICATION FILE

SATCOM Operation Technician

☒ 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: 5

Submitted By:

Submitting Body Name: Telecom Sector Skill Council

Submitting Body Contact Details:

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Section 1: Basic Details

1.	**Qualification Name**	SATCOM Operation Technician	
2.	**Sector/s**	Telecom	
3.	**Type of Qualification: ☒ New ☐ Revised ☐ Has Electives/Options** **☐OEM**	**NQR Code & version of existing/previous qualification:** *(change to previous, once approved)* **NA**	**Qualification Name of existing/previous version: NA**
4.	**a. OEM Name** **b. Qualification Name** (*Wherever applicable)*	**NA**	
5.	**National Qualification Register (NQR) Code &Version** (*Will be issued after NSQC approval)*	QG-05-TL-01993-2024-V1-TSSC	**6. NCrF/NSQF Level:** *5*
7.	**Award (Certificate/Diploma/Advance Diploma/ Any Other** *(Wherever applicable specify multiple entry/exits also & provide details in annexure)*	Certificate	
8.	**Brief Description of the Qualification**	SATCOM Operation Technician is responsible for installing antennas at remote ends, establishing links, and operating ground stations. They conduct signal analysis, maintain ground stations, and implement security measures. Additionally, they manage Network Operation Centre (NOC) or Hub, handle incident management or PM activities, and oversee network management, performance optimization, and testing for seamless SATCOM operations.	
9.	**Eligibility Criteria for Entry for Student/Trainee/Learner/Employee**	**a. Entry Qualification & Relevant Experience:**	

S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)
1.	Completed 2nd year of 3-years/4-years UG BE, B. Tech (Electrical/ Electronics & Instrumentation/ Mechanical, Civil Engineering)	No Experience Required

		2. 2-year diploma in relevant field after 12th — 1-year relevant experience 3. 3-year diploma in relevant field after 10th — 1-year relevant experience 4. Previous relevant qualification (Infrastructure Technician-5G Network, Technician 5G- Active Network Installation) of NSQF level 4 — 3 year relevant experience **b. Age:** 18 Years
10.	**Credits Assigned to this Qualification, Subject to Assessment** *(as per National Credit Framework (NCrF))*	19 — **11. Common Cost Norm Category (I/II/III)** *(wherever applicable)*: I
12.	**Any Licensing requirements for Undertaking Training on This Qualification** *(wherever applicable)*	NIL
13.	**Training Duration by Modes of Training Delivery** *(Specify **Total Duration** as per selected training delivery modes and as per requirement of the qualification)*	☒**Offline** ☐**Online** ☐**Blended** (Refer Blended Learning Annexure for details)
14.	**Aligned to NCO/ISCO Code/s** *(if no code is available mention the same)*	NCO-2015/3114.0701
15.	**Progression path after attaining the qualification** *(Please show Professional and Academic progression)*	**VERTICAL** (Level - 6) Satellite Network
16.	**Other Indian languages in which the Qualification & Model Curriculum are being submitted**	Hindi
17.	**Is similar Qualification(s) available on NQR-if yes, justification for this qualification**	☐ **Yes** ☒ **No URLs of similar Qualifications:**

Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)
Classroom (offline)	210:00	210:00	150:00	-	570:00
Online					

18.	**Is the Job Role Amenable to Persons with Disability**	**☐ Yes ☒ No** **If "Yes", specify applicable type of Disability:**	
19.	**How Participation of Women will be Encouraged**	Yes, women's participation needs to be promoted in order to ensure that they have equal opportunities in all areas of society and to further gender equality. It is essential to provide networking, mentoring, and information in addition to training and development programs. The promotion of successful women in this field and flexible work schedules may serve as inspiration and encouragement for women to pursue careers in this field. Organizations may create an inclusive and diverse culture that will help women feel valued and welcomed in these roles by putting in place rules and procedures that support equal pay and development opportunities, a pleasant and safe work environment, and work-life balance.	
20.	**Are Greening/ Environment Sustainability Aspects Covered** *(Specify the NOS/Module which covers it)*	**☒ Yes ☐ No** **DGT/VSQ/N0102**	
21.	**Is Qualification Suitable to be Offered in Schools/Colleges**	**Schools ☒ Yes ☐ No Colleges ☒ Yes ☐ No**	
22.	**Name and Contact Details of Submitting / Awarding Body SPOC** *(In case of CS or MS, provide details of both Lead AB & Supporting ABs)*	**Name: Sanjay Mehrotra** **Email:** sanjay.mehrotra@tsscindia.com **Contact No.: 0124-4148029** **Website:** https://www.tsscindia.com	
23.	**Final Approval Date by NSQC**: 31.01.2024	**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 SATCOM operation Technician	Bridge Module	Core	5	1	10:00	20:00	00:00	-	30:00	-	-	-	-	-	-
2.	Install of Antenna at remote end and establish link	TEL/N6267 Version 1.0	Core	5	3	30:00	30:00	30:00	-	90:00	30	60	-	10	100	13
3.	Set up and Operate Ground Station	TEL/N6268 Version 1.0	Core	5	2	10:00	20:00	30:00	-	60:00	30	60	-	10	100	13
4.	Signal Analysis, Ground Station Maintenance, and Security Implementation	TEL/N6269 Version 1.0	Core	5	2	20:00	40:00	00:00	-	60:00	30	60	-	10	100	13
5.	Manage Network Operation Centre (NOC) or Hub	TEL/N6270 Version 1.0	Core	5	3	30:00	30:00	30:00	-	90:00	30	60	-	10	100	13
6.	Incident management or PM Activity	TEL/N6271 Version 1.0	Core	5	3	30:00	30:00	30:00	-	90:00	30	60	-	10	100	13
7.	Network Management, Performance Optimization and Testing	TEL/N6272 Version 1.0	Core	5	2	10:00	20:00	30:00	-	60:00	30	60	-	10	100	13

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)*
8.	Manage Work, Resources and Safety at workplace	TEL/N9104 Version 2.0	Non-Core	5	1	10:00	20:00	00:00	-	30:00	30	60	-	10	100	13
9.	Employability Skills (60 Hours)	DGT/VSQ/N0102: Version 1.0	Non-Core	4	2	60:00	00:00	00:00	-	60:00	20	30	-	-	50	9
Duration (in Hours) / Total Marks					**19**	**210:00**	**210:00**	**150:00**	**-**	**570:00**	**240**	**440**	**-**	**70**	**750**	**100**

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.	**Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Graduate (Science/Electronics/ Telecom/IT and other relevant domains) with 3 year's industrial relevant experience required in SATCOM Operations.
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Graduate (Science/Electronics/ Telecom/IT and other relevant domains) with 8 year's industrial relevant experience required in SATCOM Operations.
3.	**Tools and Equipment Required for Training**	☒Yes ☐No (*If "Yes", details to be provided in Annexure)*
4.	**In Case of Revised Qualification, Details of Any Upskilling Required for Trainer**	NA

Section 4: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Graduate (Science/Electronics/ Telecom/IT and other relevant domains) with 3 years of industry relevant experience required in SATCOM Operations.
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Graduate (Science/Electronics/ Telecom/IT and other relevant domains) with 3 years of industry relevant experience required in SATCOM Operations.
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Graduate (Science/Electronics/ Telecom/IT and other relevant domains) with 8 years of industry relevant experience required in Active Networks/5G Network Domain.
4.	**Assessment Mode** *(Specify the assessment mode)*	Offline or blended
5.	**Tools and Equipment Required for Assessment**	☒ Same as for training ☐ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)*

Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	**Latest Skill Gap Study (not older than 2 years) (Yes/No):** Yes
2.	**Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):** Yes
3.	**Government /Industry initiatives/ requirement (Yes/No):** Yes
4.	**Number of Industry validation provided:** 7
5.	**Estimated nos. of persons to be trained and employed:** 22400
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** If "No", why: **In Approved**

Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	**Annexure:** NCrF/NSQF level justification based on NCrF level/NSQF descriptors *(Mandatory)*	Yes
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	Yes
3.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	Yes
4.	**Annexure:** Assessment Strategy *(Mandatory)*	Yes
5.	**Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is "Blended Learning")*	No
6.	**Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification has multiple Entry-Exit)*	Yes
7.	**Annexure:** Acronym and Glossary *(Optional)*	Yes
8.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	Yes
9.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	Yes
10.	**Supporting Document:** Occupational Map *(Mandatory)*	Yes
11.	**Supporting Document:** Assessment SOP *(Mandatory)*	Yes
12.	**Any other document you wish to submit:**	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
Professional Theoretical Knowledge/Process	The professional theoretical knowledge/process required for the job role of a SATCOM operations technician includes understanding satellite communication principles, antenna types and deployment techniques, network configuration and monitoring, software installation and configuration, signal quality analysis, security measures implementation, and adherence to regulatory requirements for SATCOM operations.	The job role of a SATCOM operations technician requires professional theoretical knowledge and processes related to satellite communication principles, antenna systems, network configuration, signal analysis, software installation, and security measures. These knowledge areas align with the NCrF/NSQF level descriptors for the job role, which involve applying theoretical concepts and processes to perform complex tasks and solve problems in a specialized field of work.	5
Professional and Technical Skills/ Expertise/ Professional Knowledge	The key professional and technical skills/expertise/professional knowledge required for SATCOM operations technician job role include proficiency in satellite communication principles, network configuration and management, antenna installation and alignment, signal quality monitoring and analysis, software installation and configuration, troubleshooting and problem-solving, understanding of industry standards and regulations, and strong knowledge of communication protocols and equipment.	The job role of a SATCOM operations technician requires professional skills such as antenna assembly, signal analysis, network configuration, software installation, and troubleshooting. Technical expertise's in satellite communication principles, network management systems, signal quality monitoring, and security measures are crucial. This job role aligns with NCrF/NSQF level descriptor 5, indicating a high level of professional knowledge and technical skills in SATCOM operations.	5
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	Employment readiness and entrepreneurship skills required for a SATCOM operations technician job role include strong problem-solving abilities, effective communication and collaboration skills, adaptability to technological advancements, critical thinking for troubleshooting, and a proactive approach to learning and self-improvement. A professional mindset includes attention to detail, time management, professionalism, and a customer-centric focus.	The employment readiness and entrepreneurship skills and mindset/professional skills required for the job role of SATCOM operations technician include technical proficiency in SATCOM principles and equipment, problem-solving abilities, adaptability to changing technologies, strong communication and teamwork skills, attention to detail, and a proactive and entrepreneurial mindset to drive innovation and continuous improvement. These skills and mindset align with the NCrF/NSQF level descriptor for the job role, which emphasizes technical competency, problem-solving abilities, effective communication, and a proactive approach to work.	5
Broad Learning Outcomes/Core Skill	The broad learning outcomes/core skills required for SATCOM operations technician job role include	The broad learning outcomes/core skills required for the job role of a SATCOM operations technician include knowledge of	5

	proficiency in satellite communication principles, network configuration and management, antenna assembly and alignment, signal quality monitoring and analysis, troubleshooting and problem-solving skills, knowledge of industry standards and regulations, and proficiency in using relevant tools and equipment for SATCOM operations.	satellite communication principles, antenna assembly and alignment, network configuration and management, signal quality monitoring and analysis, software installation and configuration, troubleshooting, security measures implementation, and adherence to industry standards. These outcomes align with the NSQF level descriptor for the job role, which emphasizes practical skills, problem-solving abilities, and knowledge of industry standards and protocols.	
Responsibility	The key responsibilities for a SATCOM operations technician include ensuring the proper functioning and maintenance of ground station equipment, performing signal analysis and troubleshooting, configuring and monitoring network connectivity, managing software installations and updates, conducting performance testing, and implementing security measures to protect the SATCOM network and communication link.	The job role of a SATCOM operations technician requires the responsibility of ensuring proper installation, configuration, and maintenance of ground station equipment and satellite communication systems. The outcomes of the job role, such as antenna assembly, network configuration, signal monitoring, and security implementation, align with the NCrF/NSQF level descriptor for the job role by demonstrating proficiency in technical skills, problem-solving, and adherence to industry standards and regulations.	5

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.	Antenna components and assembly materials	Antenna rod grip nut Antena Rotor Folding Antena Stand Fibreglass Antena Rod EPDM Small Rubber Boot Antenna Rotators Antenna Plates	1
2.	Wrenches	Material: Chrome Vanadium Steel Item Weight: 0.57 Pounds	8
3.	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	8
4.	Cable cutters	Material|: Alloy Steel Product Dimensions: 18.2L x 5.4W Centimeters Item Weight: 170 Grams	8
5.	Crimping tools	Rugged Carbon Hardened Steel Construction. High-quality hardened steel with black oxide finish resists rusting Fast, reliable crimp tool with steel body for durability with ergonomic comfort grips less strength easy to operate	8
6.	Alignment tools	Centerforce 53014 Alignment Tool: Item Weight 0. 28g	6
7.	Multimeter	Material: Bronze, Plastic Display Type: LCD Resistance: 200 Ohm, 2 K Ohm, 2 M Ohm	8
8.	Network cables	Connector Type: RJ45 Cable Type: Ethernet Compatible Devices: Laptop, PlayStation, Television, Personal Computer, Router	1

		Special Feature: High Speed , Data Transfer, Tangle Free, Waterproof	
9.	Modem or gateway device	1 Fixed Ethernet WAN Port ,1 Fixed Ethernet LAN Port, 3 Changeable Ethernet WAN/LAN Ports PPPoE Server Marshals bandwidth resource Type: Wired Without Modem Frequency: 2.4 GHz Internal Antenna	1
10.	Documentation and manuals.	Dimentions: 21.0 x 29.7 cm Pages 250	30
11.	Alarms	Material: Plastic Luxury Clock: Yes, Plastic Suitable For: Desk, Office Table, Car, Kitchen Sales Package: 1 X car watch nako, 1 x stand	2
12.	SMPS and battery bank	Rating: 600 VA Phase: Line Interactive Input voltage: 230 USB interface: No With communication interface RS-232: No Terminal marking indication: No Network Monitoring: No Product Colour: RAL9005 UPS Weight (kgs): 4.30 UPS Dimension (mm): 100 x 140 x 310 (W x D x H) Number of Batteries included: 1	1
13.	Auto Man Failure (AMF) panel	Usage/Application: Automatic start of generator in case of Mains Failure IP Rating: Ip44 Phase Type: 3 phase/ 1 phase Meter Type: Digital Material: CRCA Frequency: 50-60 Hz	1
14.	Pliers	Material Alloy Steel Product Dimensions 21L x 1.2W Centimeters Colour Red and Black Handle Material Plastic,Steel Item Weight 325 Grams Specific Uses For Product Electrical,Cutter	8

15.	Power drill	Power Source Corded Electric Maximum Rotational Speed 3000 RPM Voltage 240 Maximum Chuck Size 13 Millimeters Colour Blue Included Components Drill Attachment Special Feature Variable Speed Product Dimensions 28L x 7.2W x 27.5H Centimeters Material Metal	2
16.	Computer or 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
17.	Projector or Smartboard	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
18.	Spectrum analyzers	Spectrum Analyzer with two inputs, high quality MF/HF/VHF input for 0.1MHZ-350MHz, lesser quality UHF input for 240MHz-960MHz Built-in calibration signal generator that is used for automatic self test and low input calibration. Switchable resolution bandpass filters for both ranges between 2.6kHz and 640kHz.Color display showing 290 scan points covering up to the full low or high frequency range. When not used as Spectrum Analyzer it can be used as Signal Generator, MF/HF/VHF sinus output between 0.1MHZ-350MHz, UHF square wave output between 240MHz-960MHz. Connected to a PC via USB it becomes a PC controlled Spectrum Analyzer.Bulit-in rechargeable battery allowing a minimum of at least 2 hours portable use	1
19.	Network simulation software	Specifications: Operating system: Windows, macOS, Linux Processor: Intel Core i7 or AMD Ryzen 7 or later	1

		RAM: 16 GB Storage: 30 GB	
20.	Routers	Key Specifications: Forwarding Rate: Measured in packets per second (pps), determines how quickly the router can process and forward packets. Interface Speeds: Indicate the maximum data transfer rates for each interface, commonly ranging from 100 Mbps to 100 Gbps. Routing Protocols: Supported protocols (e.g., OSPF, BGP, RIP) dictate how the router learns and maintains network paths. Memory: RAM and storage capacity influence performance and route table storage. CPU: Processing power affects overall performance and the ability to handle complex routing tasks. Queue Size: Determines how many packets can be held per interface before congestion occurs. QoS Features: Support for Quality of Service mechanisms ensures prioritization of critical traffic.	1
21.	Radio Access Network (RAN) equipment	RAN equipment typically includes: Base Stations (BTS): Transmit and receive radio signals to and from user devices. Radio Frequency (RF) Units: Amplify and filter radio signals. Baseband Units (BBUs): Process digital signals and control radio access. Controllers: Manage and coordinate multiple base stations. Specifications vary widely based on factors like network technology (2G, 3G, 4G, 5G), frequency bands, capacity requirements, and power consumption.	1
22.	Service Management and Orchestration (SMO) solution	Specifications: Hybrid and multi-cloud support IT service automation Runbook automation Configuration management Self-service provisioning	1
23.	Network Function Virtualization (NFV) components	Specifications: VNFs vary depending on the specific function they perform, but they typically require a CPU, memory, storage, and network connectivity	1

24.	Virtual infrastructure for hosting VNFs	Components of a Virtual Infrastructure for VNFs: Compute: This refers to the servers that will run the VNFs. Popular options include: Bare-metal servers: Powerful and dedicated, but require manual configuration. Brands like Dell, HP, Lenovo dominate. Virtualization platforms: Software like VMware vSphere or OpenStack virtualize the hardware, allowing efficient resource sharing. Storage: This stores the VNF software and data. Options include: SAN (Storage Area Network): Dedicated high-performance storage for critical VNFs. Brands like NetApp, Dell EMC are common. NAS (Network Attached Storage): Cost-effective option for less demanding VNFs. Brands like Synology, QNAP are popular. Networking: This connects all the components and ensures smooth data flow. Options include: Network switches: Manage data traffic within the infrastructure. Brands like Cisco, HPE Aruba are prominent. Network firewalls: Secure the network and VNFs. Palo Alto Networks, Fortinet are well-known providers. Management and Orchestration (MANO): This software manages and automates the VNF lifecycle. OpenStack, ONAP, and proprietary solutions from vendors like VMware are options.	1
25.	Firewalls	Dual-band Wi-Fi 6 (AX6000) router with built-in firewall - Gigabit Ethernet ports for wired connections - Supports MU-MIMO and beamforming for improved wireless performance - Advanced security features like SPI firewall, DoS protection, and parental controls	1
26.	Signal Capture Equipment	2x RF inputs, 2x RF outputs for RF Capture & Playback (SMA/F connectors)*Variable bandwidth from 1 up to 55 MHzAutomatic filtering: harmonic suppression for playback, out of band signal suppression for captureRF reception:• Status indicators: USB connection / IQ sample loss / In band saturation (ADC) / Out of band saturation (LNA)• FFT display: Spectrum measurements: FFT resolution, FFT markers insertion /	1

		Averaging functions: RMS, min/max hold / FFT window functions: rectangular, Hamming, Blackman, Hann…• Signal waterfall plot (three-dimensional spectrum)• Power in band measurementTrigger mode for synchronized capture/playback between several devicesRF capture: variable gain, automatic gain setting (AGC), rolling buffer modeRF playback: variable attenuationLightweight and compact 163 x 115 x 32 mm, 600 g, 3 W typical power consumptionConnected to PC via USB3.0 connectivity (SuperSpeed) (USB2 backward compatible, but with lower performances due to limited USB2 bitrate)IQ files stored on the PC: 12 Msps sample rate, 170 min of record = 512GBNonproprietary IQ file format, compatible with Matlab softwareIQ file conversion support: IQW (Lumantek) <-> RF-Catcher, WFM (Adivic) -> RF-Catcher, DAT (Eiden) <-> RF-Catcher, BIN (Averna) <-> RF-Catcher, CBB (IZT) -> RF-Catcher, RF-Catcher -> ARB, A74 <-> RF-CatcherIntegrated GNSS (GPS, GLONASS) receiver: KML file, metadata, NMEA protocolCompatible Windows 7, 8/8.1, 10 (x64 versions only)*Both input/output connectors cannot be used at the same time	

Classroom Aids

The aids required to conduct sessions in the classroom are:

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

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	Alt Advisor	Malar	Managing Partner	F-12, DS-IV, Uttarpan, MCC, Ultadanga, Kolkata-700054	9830803100	altfin.co@gmail.com	

2	CHMS Pvt. Ltd. (OPC)	Sudip Gupta	Director	Dashodron, Rajarhat New Town, North 24 Parganas, Kolkata - 700136	9903954061	team@careerhuntmanpower.com	
3	Dipti Consultancy Pvt.Ltd.	Ambar Shome	HR Head	EC-48, Ghosh Para, PO – Desh Bandhu Nagar, PS – Rajarhat, 24 Parganas (N), Kolkata - 700059	98746 41344	subhro@pkfc.in	
4	Dreamz Tech Solutions	Kaushiki Mazumder	Recruitment Lead	AQ-7, 6th floor, Ambient Building, Sector V, Saltlake city, Kolkata 700091	033-40040627	marketing@dreamztech.com	
5	Global Digital Care	Sudip Roy	Founder	AB-189, Salt Lake, Sector -1, Kolkata-700064	9831595105	globaldigitalcare@gmail.com	
6	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	mail@senrysa.com	
7	Vipanan Management Services	Sudip Roy	Founder	10th Floor. Tower B, Unitech Cyber Park, Sector -39, Gurgaon, India - 122003	9831595105	vipananmanagementservices@gmail.com	

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	☐Theory/ Lectures - Imparting theoretical and conceptual knowledge		
2	☐Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		
3	☐Showing Practical Demonstrations to the learners		
4	☐Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		
5	☐Tutorials/ Assignments/ Drill/ Practice		

6	☐Proctored Monitoring/ Assessment/ Evaluation/ Examinations		
7	☐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
TEL/N6267: Install of Antenna at remote end and establish link	PC1. identify the telenet tools and IPv4 setting in laptop	1	1	-	-
	PC2. assemble the antenna as per provided guidelines using prescribed tools	1	1	-	-
	PC3. review the necessary guidelines, including the antenna assembly instructions, safety precautions, and any specific requirements	1	1	-	-
	PC4. collect the necessary tools like wrenches, screwdrivers, cable cutters, crimping tools, torque wrenches, alignment tools, and any specialized tools mentioned in the instructions	1	1	-	-
	PC5. test and commission the antenna	-	1	-	1
	PC6. set up a clean and organized work area with enough space to assemble the antenna	1	1	-	-
	PC7. identify and familiarize with the various components of the antenna system, such as the reflector, feed assembly, mounting brackets, cables, and connectors	-	2	-	-

	PC8. follow the guidelines to mount the antenna on the designated structure or mount	1	1	-	-
	PC9. prescribe tools to secure the antenna assembly properly	2	1	-	1
	PC10. attach the cables to the appropriate connectors on the feed assembly and ensure they are securely fastened	1	2	-	-
	PC11. use cable cutters, crimping tools, or other specified tools for cable termination or connector installation	1	1	-	-
	PC12. use a torque wrench to tighten bolts and nuts to the recommended torque values	1	1	-	-
	PC13. ensure proper grounding of the antenna system to minimize the risk of electrical hazards and protect against lightning strikes	1	2	-	-
	PC14. double-check all connections, ensuring they are correctly installed and tightened	-	2	-	1
	PC15. inspect the entire antenna assembly for any visible damage, loose components, or irregularities	1	2	-	-
	PC16. install and configure software according to IDU (Indoor Unit-Modem)	-	1	-	1
	PC17. ensure that the computer or server where the software will be installed meets the minimum requirements specified by the manufacturer like hardware specifications, operating system compatibility, and available storage space	1	2	-	-
	PC18. physically connect the IDU modem to the computer or server using the appropriate interface, such as Ethernet, USB, or serial connection	-	2	-	-
	PC19. access the management software or configuration interface provided by the manufacturer to configure network settings for the IDU modem which include IP address, subnet mask, default gateway, and any other network parameters required for communication with other devices or networks	1	1	-	-
	PC20. check for any available firmware or software updates for the IDU modem	1	2	-	-
	PC21. verify the connectivity between the IDU modem and the satellite network or other associated devices	1	2	-	-
	PC22. perform tests to ensure proper signal acquisition, data transmission, and system functionality	-	2	-	1
	PC23. maintain a record of the software installation and configuration details, including any changes made to default settings	-	-	-	-

	PC24. regularly monitor the performance and health of the IDU modem software	-	2	-	1
	PC25. access modem with master IP in web browser	-	1	-	-
	PC26. master IP address is a unique address assigned to the modem or gateway device in the SATCOM network	1	1	-	-
	PC27. obtain the master IP address from the network administrator or refer to the modem's documentation	-	1	-	-
	PC28. connect computer with network IP modem	-	1	-	1
	PC29. connect computer to the network using an Ethernet cable or via a Wi-Fi connection	-	1	-	-
	PC30. open a Web Browser and use Google Chrome, Mozilla Firefox, Microsoft Edge, or Safari	-	1	-	-
	PC31. exact options and menus available will depend on the specific modem model and manufacturer	1	1	-	1
	PC32. set the master IP to 192.168.0.1	-	1	-	-
	PC33. connect to the device or system that manages the SATCOM operations, typically a network router, switch, or satellite modem	1	2	-	-
	PC34. enter the appropriate username and password to log in to the configuration interface	1	1	-	-
	PC35. look for the IP address configuration settings. This can typically be found under a section called "LAN Settings," "Network Setup," or similar	1	2	-	-
	PC36. along with the IP address, and need to specify the subnet mask and default gateway	1	1	-	-
	PC37. apply IP assignment on laptop or computer	-	1	-	-
	PC38. identify and understand features of system libraries and files related to be installed	-	1	-	-
	PC40. consult system manuals, documentation, and vendor-provided information to understand the required libraries and files for installation and operation	1	1	-	-
	PC41. review the system requirements provided by the SATCOM system vendor or manufacturer	-	1	-	1
	PC42. examine the SATCOM system's architecture and components to identify any specific libraries and files associated with each component	1	1	-	-
	PC43. review the release notes and change logs provided by the SATCOM system vendor	1	1	-	-

	PC44. look for system libraries, configuration files, and any additional files that are essential for SATCOM operations	1	1	-	-
	PC45. conduct thorough testing to ensure that all required system libraries and files are present and functioning correctly	1	1	-	-
	PC46. regularly check for new versions of libraries and files associated with the system to ensure that you are using the latest and most stable versions	1	2	-	-
	PC47. use mutimeter for voltage measurement	-	1	-	1
	Total Marks	**30**	**60**	**-**	**10**
TEL/N6268: Set up and Operate Ground Station	PC1. properly install and align the ground station antenna, thermal control system, power system, attitude and orbit control system to achieve the required gain and polarization, ensuring optimal signal reception and transmission	1	4	-	1
	PC2. choose an appropriate location for the ground station antenna that provides a clear line of sight to the satellite	2	4	-	1
	PC3. install a sturdy and stable mounting structure, such as a tripod, tower, or rooftop platform, that can support the weight and size of the antenna	1	2	-	-
	PC4. position the antenna on the mounting structure while ensuring that it is level and plumb	1	4	-	1
	PC5. use a bubble level or inclinometer to achieve precise positioning	2	2	-	1
	PC6. determine the azimuth angle required to align the antenna with the satellite	1	2	-	1
	PC7. determine the elevation angle required for the antenna to point toward the satellite	2	4	-	-
	PC8. fine-tune the antenna's azimuth, elevation, and polarization adjustments by referring to a signal strength meter or receiver connected to the antenna	2	2	-	-
	PC9. use the appropriate equipment, such as a spectrum analyzer or satellite signal meter, to verify the signal quality and strength	2	2	-	-
	PC10. monitor the signal parameters, including signal-to-noise ratio (SNR), carrier-to-noise ratio (C/N), and bit error rate (BER), to ensure optimal signal reception	1	2	-	1
	PC11. securely fasten all mounting brackets, bolts, and nuts to ensure that the antenna remains stable and maintains its alignment over time	1	2	-	-

	PC12. implement proper grounding for the antenna system to protect against electrical hazards and lightning strikes	2	2	-	-
	PC13. connect the grounding wire to a designated ground point or grounding rod as per local electrical codes and safety guidelines	1	4	-	1
	PC14. Perform accurate tracking and pointing of the antenna towards the satellite, maintaining precise azimuth and elevation angles for a stable communication link	1	2	-	-
	PC15. technical identify the specifications of the antenna, including its range of motion, azimuth, and elevation angles, and any associated tracking mechanisms or software	1	4	-	1
	PC16. Gather information about the satellite that intend to communicate with, including its orbital parameters, position in the sky, and azimuth and elevation angles required for optimal signal reception	2	2	-	-
	PC17. identify the initial position from which to start tracking the satellite	1	4	-	1
	PC18. Ensure that the azimuth and elevation indicators on the antenna and tracking system are calibrated and accurate. This may involve using reference markers, measuring instruments, or software tools to align the indicators properly	2	2	-	-
	PC19. adjust the azimuth and elevation angles of the antenna, keeping an eye on the signal strength or quality indicators	1	4	-	-
	PC20. utilize tracking software or mechanisms provided with the ground station setup	1	2	-	-
	PC21. monitor the signal strength and quality indicators while making adjustments to the antenna's position	1	2	-	1
	PC22. make small adjustments to further refine the antenna's position. Pay attention to any fluctuations in signal strength or quality and make slight changes to maintain the best possible communication link	1	2	-	-
	Total Marks	**30**	**60**	**-**	**10**
TEL/N6269: Signal Analysis, Ground Station Maintenance, and Security Implementation	PC 1. monitor and analyze signal quality parameters such as signal-to-noise ratio (SNR), bit error rate (BER), and carrier-to-noise ratio (C/N) to assess and optimize the performance of the communication link.	1	3	-	-

	PC 2. use appropriate tools and equipment to measure signal quality parameters such as signal-to-noise ratio (SNR), bit error rate (BER), and carrier-to-noise ratio (C/N)	1	2	-	-
	PC 3. connect the monitoring equipment to the relevant points in the ground station setup	1	1	-	-
	PC 4. keep the monitoring equipment running to continuously monitor the signal quality parameters during operation	-	2	-	1
	PC 5. maintain a record of the measured signal quality parameters at regular intervals	1	1	-	-
	PC 6. use the recorded data to analyze the signal quality parameters over time.	1	1	-	1
	PC 7. conduct regular maintenance and inspections of the ground station equipment, including antenna, feed system, tracking mechanisms, and associated electronics, to ensure proper functioning and reliability	2	3	-	-
	PC 8. establish a maintenance schedule that outlines the frequency and tasks for inspecting and maintaining the ground station equipment	1	3	-	1
	PC 9. verify the antenna alignment periodically to ensure it is pointing accurately towards the satellite	1	3	-	1
	PC 10. check the tracking mechanisms, such as azimuth and elevation systems, for proper calibration	2	3	-	-
	PC 11. inspect all cables and connectors for signs of damage, wear, or loose connections	1	3	-	1
	PC 12. verify the electrical system components, including power supplies, grounding, surge protection devices, and wiring connections	2	3	-	-

	PC 13. functional tests on the ground station equipment to ensure proper functioning and alignment	1	2	-	1
	PC 14. implement appropriate security measures, including access controls, encryption protocols, and intrusion detection systems, to protect the ground station and the communication link from unauthorized access and cyber threats	1	2	-	1
	PC 15. access levels and user roles based on job responsibilities and the principle of least privilege	1	2	-	-
	PC 16. update access control policies to ensure they align with the evolving security requirements	2	2	-	-
	PC 17. deploy intrusion detection and prevention systems to monitor network traffic and identify potential security breaches or unauthorized activities	3	4	-	-
	PC 18. configure the IDPS to detect and alert on suspicious network events, such as unauthorized access attempts, network scanning, or abnormal traffic patterns	1	2	-	1
	PC 19. implement automated response mechanisms within the IDPS to block or mitigate identified threats in real-time	1	2	-	-
	PC 20. install firewalls to enforce network security policies and control traffic entering and leaving the ground station network	1	3	-	-
	PC 21. update and patch all software, firmware, and operating systems used in the ground station setup	1	3	-	1
	PC 22. develop an incident response plan outlining the steps to be taken in the event of a security breach or cyber-attack	1	2	-	1
	PC 23. establish backup and disaster recovery procedures to ensure timely recovery and continuity of operations in case of a security incident or system failure	2	5	-	-

	PC 24.implement continuous monitoring tools to track and analyze network activity, system logs, and security events in real-time	1	3	-	-
	Total Marks	**30**	**60**	**-**	**10**
TEL/N6270: Manage Network Operation Centre (NOC) or Hub	PC1. implement gateway ID and assign a unique gateway ID to each SATCOM gateway in the network	1	2	-	-
	PC2. determine the format and structure of the gateway ID	1	2	-	-
	PC3. integrate the gateway ID information into Network Management System (NMS) or operations support systems	1	2	-	-
	PC4. implement configuration management processes to track and manage changes to gateway IDs	1	2	-	1
	PC5. utilize the gateway IDs to monitor the performance and troubleshoot any issues with the SATCOM gateways	1	1	-	-
	PC6. incorporate security measures into the gateway ID implementation and conduct periodic audits to verify the accuracy and validity of gateway IDs	1	1	-	1
	PC7. create a site-code or folder for organizing SATCOM-related data	-	1	-	-
	PC8. store data to internal and external storage systems	1	1	-	-
	PC9. test data connectivity and ensure that the satellite signal strength is strong enough for reliable transmission	1	1	-	1
	PC10. use a satellite signal meter or spectrum analyzer to measure signal strength and confirm it meets required specifications	1	1	-	-
	PC11. check the alignment of the satellite antenna to ensure it is accurately pointed towards the desired satellite	1	1	-	1
	PC12. perform a link budget analysis to assess expected performance of the satellite link	-	2	-	-
	PC13. set up a test environment with necessary equipment, including a satellite modem or transceiver	1	1	-	1
	PC14. use specialized network testing tools or software to generate traffic and measure data transfer rates	1	1	-	-
	PC15. perform ping or latency tests to measure round-trip time for data packets between the ground station and remote location	1	2	-	-
	PC16. monitor the data connection for errors or anomalies, using appropriate tools to measure error rate and bit error rate (BER) of transmitted data	1	1	-	-
	PC17. simulate link failures or switchovers and verify that data connectivity is maintained without significant interruptions	1	1	-	1

	PC18. perform field tests at different locations within the coverage area to assess data connectivity under varying conditions	-	2	-	-
	PC19. design a database schema that reflects specific requirements of SATCOM operations	-	1	-	-
	PC20. create a relational database using a database management system (DBMS) and import relevant data from various sources	1	2	-	-
	PC21. utilize the Network Management System (NMS) to monitor and manage the SATCOM network	1	2	-	-
	PC22. collect and analyze performance data using the database and NMS, including signal strength, link utilization, latency, and throughput	-	2	-	-
	PC23. implement fault management features within the NMS to detect and respond to anomalies	1	1	-	-
	PC24. leverage the database to store and manage configurations of SATCOM devices	1	-	-	-
	PC25. apply commands to query data from the database	1	2	-	-
	PC26. configure IP addresses, ensuring no overlap or conflicts and determining subnet masks for each subnet	1	2	-	-
	PC27. set up network monitoring tools to monitor performance, availability, and security of the SATCOM network	-	2	-	1
	PC28. configure DHCP (Dynamic Host Configuration Protocol) for IP address allocation	1	1	-	-
	PC29. configure SATCOM devices with their respective static IP addresses, subnet masks, and other network parameters	-	2	-	-
	PC30. provide Content Providers and resolvers to interface with customers	-	1	-	-
	PC31. assign LAN IP addresses and provide network names	1	1	-	-
	PC32. configure NATing (Network Address Translation) for address translation between private and public networks	-	1	-	-
	PC33. monitor Rx and TX of remote site at regular interval	-	1	-	1
	PC34. control data rate or data packages as required	1	1	-	-
	PC35. backup NMS for data protection and disaster recovery	-	1	-	-
	PC36. add routes on specific routing tables as needed	1	2	-	-
	PC37. choose appropriate antennas with high gain and narrow beamwidth for improved RX and TX signals	1	2	-	1
	PC38. conduct thorough frequency planning to select suitable frequencies for SATCOM operations	1	2	-	-

	PC39. analyze interference patterns and ensure compatibility with the desired satellite system	2	3	-	-
	PC40. invest in high-quality transceivers with excellent RX sensitivity and TX power output	1	3	-	1
	Total Marks	**30**	**60**	**-**	**10**
TEL/N6271: Incident management or PM Activity	PC1. understand the cause of the down call	3	6	-	1
	PC2. examine the SATCOM equipment for any signs of malfunction or failure	3	6	-	1
	PC3. inspect transceivers, modems, routers, or other components that may contribute to the down call	3	6	-	1
	PC4. analyze potential sources of interference, including adjacent satellites, other communication systems, or electromagnetic interference	3	6	-	1
	PC5. perform tests such as ping tests, latency measurements, or bit error rate (BER) calculations to further pinpoint the cause of the down call utilizing diagnostic tools or software	3	6	-	1
	PC6. assess the satellite signal strength using a satellite signal meter or spectrum analyzer to ensure it meets the required specifications	3	6	-	1
	PC7. confirm the alignment of the satellite antenna to ensure it is accurately pointing towards the desired satellite	3	6	-	1
	PC8. measure the strength of the satellite signal using a satellite signal meter or spectrum analyzer	3	6	-	1
	PC9. verify the alignment of the satellite antenna to ensure it is accurately pointed towards the desired satellite	3	6	-	1
	PC10. perform a link budget analysis to assess the expected performance of the satellite link	3	6	-	1
	Total Marks	**30**	**60**	**-**	**10**
TEL/N6272: Network Management, Performance Optimization and Testing	PC 1. check the network configuration, including IP addresses, subnet masks, routing tables, and NATing settings	3	4	-	-
	PC 2. analyze network traffic using monitoring tools to identify any abnormal patterns, high packet loss, or congestion	3	4	-	1
	PC 3. verify the data connectivity between the SATCOM gateway and remote locations	3	4	-	1
	PC 4. monitor the data connection for errors or anomalies	3	4	-	1

	PC 5. conduct field tests at different locations within the coverage area to assess data connectivity under varying conditions	3	4	-	-
	PC 6. perform a link budget analysis to assess the expected performance of the satellite link	3	7	-	1
	PC 7. generate traffic and measure the data transfer rates using specialized network testing tools or software	4	6	-	1
	PC 8. simulate link failures or switchovers to verify that data connectivity is maintained without significant interruptions	3	7	-	1
	PC 9. utilize a database management system (DBMS) and network management system (NMS) to collect and analyze performance data	1	5	-	1
	PC 10. monitor signal strength, link utilization, latency, and throughput to identify any anomalies or areas for improvement	2	5	-	1
	PC 11. inspect industry associations such as the International Telecommunication Union (ITU), Global VSAT Forum (GVF), or Satellite Industry Association (SIA)	1	5	-	1
	PC 12. perform testing of SATCOM accessories	1	5	-	1
	Total Marks	**30**	**60**	**-**	**10**
TEL/N9104: Manage Work, Resources and Safety at workplace	**PC1.** develop technical and personal skills to be updated with new technologies prevalent in the industry	2	1	-	-
	PC2. train the team such that they are able to adapt latest products/services in their working environment	1	2	-	-
	PC3. identify opportunities for team building workshops and motivational trainings	1	2	-	-
	PC4. guide the team to be accountable for timely completion of tasks	2	3	-	-
	PC5. analyse problems accurately to be able to correctly suggest suitable solutions to the concerned persons	1	2	-	-
	PC6. train the team to estimate the cause of the problem and validate				

		1	2	-	-
	PC7. implement ways to keep immediate as well as team's work area clean and tidy	1	2	-	-
	PC8. maintain efficiency and productivity while performing role/responsibility	1	2	-	2
	PC9. supervise the team to ensure that the work is done as per the assigned and agreed requirements	1	2	-	1
	PC10. create schedules and rosters for the team to ensure they understand individual work requirements	2	3	-	1
	PC11. identify organisation's health, safety, security policies and procedures	3	3	-	-
	PC12. instruct team to report any identified breaches in health, safety, and security policies and procedures to the designated person	3	3	-	-
	PC13. manage 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	3	4	-	1
	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	3	3	-	1
	PC15. implement ways to optimize usage of material including water in various tasks/activities/processes	1	2	-	1
	PC16. supervise the team to ensure responsible use of resources	2	2	-	1
	PC17. motivate the team to carry out routine cleaning of tools, machine and equipment	2	2	-	1
	PC18. guide the team to optimize use of electricity/energy in various tasks/activities/processes	3	4	-	-
	PC19. implement periodic checks of the functioning of the equipment/machine and rectify wherever required	2	2	-	1
	PC20. guide the team to report malfunctioning and lapses in maintenance of equipment	3	2	-	-
	PC21. implement ways to use electrical equipment and appliances properly	2	2	-	-
	Total Marks	**40**	**50**	**-**	**10**

DGT/VSQ/N0102: Employability Skills (60 Hours)	*Introduction to Employability Skills*	**1**	**1**	**-**	**-**
	PC1. identify employability skills required for jobs in various industries	-	-	-	-
	PC2. identify and explore learning and employability portals	-	-	-	-
	Constitutional values – Citizenship	**1**	**1**	**-**	**-**
	PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
	PC4. follow environmentally sustainable practices	-	-	-	-
	Becoming a Professional in the 21st Century	**2**	**4**	**-**	**-**
	PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
	PC6. practice the 21st Century Skills such as Self- Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
	Basic English Skills	**2**	**3**	**-**	**-**
	PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
	PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
	PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
	Career Development & Goal Setting	**1**	**2**	**-**	**-**
	PC10. understand the difference between job and career				

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

	PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-
	Entrepreneurship	**2**	**3**	-	-
	PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
	PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
	PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
	Customer Service	**1**	**2**	-	-
	PC26. identify different types of customers	-	-	-	-
	PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
	PC28. follow appropriate hygiene and grooming standards	-	-	-	-
	Getting ready for apprenticeship & Jobs	**2**	**3**	-	-
	PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
	PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
	PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
	PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
	PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-

	Total Marks	**20**	**30**	**-**	**-**
Grand Total		**240**	**440**	**-**	**70**

Annexure: 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.
   - The 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 is for the unskilled & semi- skilled individuals, and level 4 and above are for the skilled, supervisor & higher management.
   - An assessor must be ToA certified & the trainer must be ToT Certified.
   - The 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:**
   - A surprise visit to the assessment location.
   - A 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.

7. 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.

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
National Occupational Standards (NOS)	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.
Qualification	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
Qualification File	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.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.
Long Term Training	Long-term skilling means any vocational training program undertaken for a year and above. https://ncvet.gov.in/sites/default/files/NCVET.pdf