QUALIFICATION FILE

5G System Integrator

☒ 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:

Telephone: 0124-4148029

Email: tssc@tsscindia.com

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Section 1: Basic Details

1.	**Qualification Name**	5G System Integrator	
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-00930-2023-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**	5G System Integrator is responsible for designing, implementing, and maintaining 5G network. The individual collaborates with cross-functional teams to develop and optimize network solutions, ensuring high-speed connectivity, low latency, and reliable performance. Their duties include planning network architecture, troubleshooting network issues, conducting system testing, and staying updated with emerging 5G technologies. They also play a crucial role in enabling the deployment and efficient operation of 5G networks to support the evolving demands of the telecommunications industry.	
9.	**Eligibility Criteria for Entry for Student/Trainee/Learner/Employee**	**a. Entry Qualification & Relevant Experience:**	

b. Age: 18 Years

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 (Electronics/Telecom/IT and other relevant domains)	No Experience Required
2.	Pursuing 2nd year of 3-years/4-years UG (Electronics/Telecom/IT and other relevant domains) and continuing education	No Experience Required
3.	Completed 1st year of 3-years/4-years UG (Electronics/Telecom/IT and other relevant domains)	1-year relevant experience
4.	Completed 3-year diploma (Electronics/ Telecom/IT and other relevant domains) after 10	1-year relevant experience
5.	12th Grade pass	2-year relevant experience

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**	
14.	**Aligned to NCO/ISCO Code/s** *(if no code is available mention the same)*	NCO-2015/7422.2201	
15.	**Progression path after attaining the qualification** *(Please show Professional and Academic progression)*	**Vertical progression** NSQF Level 6 – Cluster Manager	

Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)
Classroom (offline)	240:00	180:00	150:00	-	570:00
Online					

(Refer Blended Learning Annexure for details)

		Horizontal progression NSQF Level 5 – Project Engineer - 5G Networks	
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:**	
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, 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 Telecom 5G System Integrator 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 Telecom Grameen Udhyami job roles, through policies and practices that support work-life balance, equal pay and promotion opportunities, and a safe and respectful workplace.	
20.	**Are Greening/ Environment Sustainability Aspects Covered** *(Specify the NOS/Module which covers it)*	**☒ Yes ☐ No**	
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: Telecom Sector Skill Council** **Email: tssc@tsscindia.com** **Contact No.: 0124-4148029** **Website: https://www.tsscindia.com**	
23.	**Final Approval Date by NSQC**: 31 Aug 2023	**24. Validity Duration:** 3 Years	**25. Next Review Date:** 31 Aug 2026

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 5G System Integrator	Bridge Module	-	5	1	10.00	20.00	0.00	00:00	30.00	-	-	-	-	-	-
2.	Set Standards for 5G Network Architecture	TEL/N4205 Version 1.0	Core	5	5	50.00	40.00	60.00	00:00	150.00	50	40	-	10	100	22
3.	Verify and Prepare Hardware Equipment for 5G Installation	TEL/N4206 Version 1.0	Core	5	3	30.00	30.00	30.00	00:00	90.00	50	40	-	10	100	22
4.	Design Spectrum and 5G Network Architecture	TEL/N4207 Version 1.0	Core	5	4	40.00	50.00	30.00	00:00	120.00	50	40	-	10	100	22
5.	Implement 5G New Radio (NR) and Radio Access	TEL/N4208 Version 1.0	Core	5	4	50.00	40.00	30.00	00:00	120.00	40	50	-	10	100	22
6.	Employability Skills (60 hours)	DGT/VSQ/N0102	Non-Core	4	2	60.00	00.00	00:00	00:00	60:00	20	30	-	-	50	12
Duration (in Hours) / Total Marks					19	**240.00**	**180.00**	**150.00**	**-**	**570.00**	**210**	**200**	**0**	**40**	**450**	**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: 70 % *(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 1 years of industry relevant experience required in 5G System
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 3 years of industry relevant experience required in 5G System
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 1 years of industry relevant experience required in 5G System
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Graduate in any field
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 1 years of industry relevant experience required in 5G System
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:** 5
5.	**Estimated nos. of persons to be trained and employed:** 7400
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** If "No", why: **Yes**

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	A 5G System Integrator requires professional theoretical knowledge and expertise in areas such as wireless communication systems, network architecture, signal processing, antenna technology, and network optimization. They must possess a deep understanding of 5G technology, including its standards, protocols, and deployment scenarios, in order to effectively design, implement, and troubleshoot 5G networks and services.	The job role of a 5G System Integrator requires a high level of theoretical knowledge and expertise in the field of 5G technology. It encompasses understanding the National Competency Framework (NCrF) and National Skills Qualification Framework (NSQF) level descriptors to ensure that the job outcomes align with the required standards and competencies.	5
Professional and Technical Skills/ Expertise/ Professional Knowledge	A 5G System Integrator should possess professional and technical skills such as in-depth knowledge of 5G architecture, protocols, and standards. They should be proficient in network design, optimization, and troubleshooting, with expertise in wireless technologies, virtualization, and cloud computing. Strong problem-solving, communication, and teamwork abilities are also crucial.	A 5G System Integrator should possess professional and technical skills/expertise in areas such as wireless communication, network architecture, protocol stack, virtualization, cybersecurity, and IoT integration. Their professional knowledge should align with the NCrF/NSQF level descriptor, indicating proficiency in advanced 5G technologies, network planning, optimization, troubleshooting, and project management.	5
Employment Readiness & Entrepreneurship **Skills & Mind-set/Professional Skill**	Employment readiness and entrepreneurship skills for a 5G System Integrator include strong technical knowledge of 5G networks, proficiency in programming and software development, problem-solving abilities, effective communication, adaptability to evolving technologies, and a proactive and innovative mindset. These skills enable engineers to design, deploy, and optimize 5G networks, ensuring successful outcomes in their job role.	The employment readiness and entrepreneurship skills and mindset required for a job role as a 5G System Integrator engineer include strong technical knowledge of 5G networks, problem-solving abilities, adaptability to technological advancements, effective communication and collaboration skills, and the ability to think critically and innovate. These skills align with the National Common Mobility Framework (NCrF) and National Skills Qualification Framework (NSQF) level descriptors for the job role at a proficient level.	5
Broad Learning Outcomes/Core Skill	The broad learning outcomes and core skills for the job role of a 5G System Integrator include a deep understanding of 5G technology, proficiency in network design and optimization, expertise in troubleshooting and resolving network issues, knowledge of virtualization and cloud	The broad learning outcomes/core skills for a job role as a 5G System Integrator include proficiency in network architecture, understanding of 5G technologies, implementation and troubleshooting skills, knowledge of virtualization and cloud computing, ability to analyze and optimize network	5

	computing, and effective communication and collaboration skills for teamwork and project management.	performance, and strong communication and teamwork abilities. These outcomes align with the National Common Reference Framework (NCrF)/National Skills Qualification Framework (NSQF) level descriptor for the job role.	
Responsibility	A 5G System Integrator is responsible for designing, implementing, and optimizing 5G network systems. Their key requirements include analyzing network performance, troubleshooting issues, ensuring network security, collaborating with cross-functional teams, and staying updated with emerging technologies. The outcome of their qualification is the successful deployment and operation of efficient and reliable 5G networks.	As a 5G System Integrator, your responsibilities align with the NCrF/NSQF level descriptor by demonstrating advanced knowledge and skills in designing, deploying, and optimizing 5G networks. You are expected to contribute to the development of 5G solutions, ensure network reliability and performance, and stay updated with emerging technologies in the field.	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	Port Scanner	2 GB RAM, 100 MB storage, OS- Mac, Windows	2
2	Switch Port Mapper	2 GB RAM, 100 MB storage, OS- Mac, Windows	2
3	IP Network Browser	2 GB RAM, 100 MB storage, OS- Mac, Windows	2
4	Network Performance Monitoring Sensors/ Devices		2
5	Routers	With Ethernet Porte	2
6	Switches	Port Speed 10 Mbps (Ethernet), 100 Mbps (Fast Ethernet), Ethernet standard 10BASE-T, 100BASE-TX, 1000BASE-T, 10GBASE-T, and beyond	2
7	Intrusion Prevention Systems		2
8	NOC Network Monitoring Software – Pre-installed in Laptop/Desktop	4 GB RAM, 100 MB storage, OS- Mac, Windows, Linux	1
9	Personal Protective Equipment	ISI Marked	1
10	First Aid Kit		1

Classroom Aids

The aids required to conduct sessions in the classroom are:

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

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	AXAY ELECTRICAL (India) Private Limited	Sailesh Prajapati	Operation Head	204, Nirman House, Nr. Usmanpura Under Bridge, Usmanpura, Ahmedabad	9067018901	sailesh.prajapati@axayelectrical.com	
2	Mandal Telelink	Bapi Mandal	Proprietor	Jemo Nilkanthapur, Jemo Rajbati, Kandi, Murshidabad - 742140	8617838676	mandalbapi620@gmail.com	
3	Retrofit Technology Private Limited	Raj Kishore Raj	Director	Pallavi Palace, Beur Jail Road, Beur, Patna-800002	9708097810	rajkishore_raj@hotmail.com	
4	Amantya Technologies Private Limited	Gaurav Saini	AVP- Presale	12th Floor, Unit-1201-1207, Unitech World-Cyber Park, Aarya Samaj Road Sector39, Gurgaon, Gurgaon, Haryana, 122022	9312659540	gaurav.saini@amantyatech.com	
5	Sri Manjunath Technical Services	Ch V Ranga Rao	Proprietor	Plot No: 38, SMTS TOWERS, Adj Kesineni admin office, Sri Ramachandra Nagar, Mahanadu Road, Vijayawada, AP - 520008	8106223344	gangarao.chv@smtsgroup.in	

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	500	400	200	150	0	0
24-25	2400	2200	500	300	0	0
25-26	4500	4000	800	600	0	0

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/N4205: Set Standards for 5G Network Architecture	**PC1.**	define the technical specifications for 5G network elements, including base stations (gNB), core network components, and user equipment	-	-	-	2
	PC2.	determine the frequency bands to be used for the IMT-2020 deployment.	3	4	-	-
	PC3.	allocate and specify the frequency bands to be used for 5G deployment, considering spectrum availability and compatibility	2	-	-	2
	PC4.	install the necessary infrastructure equipment, including base stations, Radio Access Network (RAN), and core network elements such as the serving and gateway.	3	3	-	1
	PC5.	configure the RAN elements, including the base stations and RNCs (Radio Network Controllers) or eNodeBs (eNBs, which are specific to 4G/5G).	3	4	-	-
	PC6.	perform network planning activities to design the coverage and capacity of the network.	2	3	-	-
	PC7.	implement subscriber authentication and security mechanisms.	3	-	-	1
	PC8.	enable specific services and features, such as voice calls, data services, messaging, and multimedia services.	5	1	-	-
	PC9.	perform testing and optimization activities to verify the network's performance and fine-tune the configuration parameters.	5	2	-	-
	PC10.	analyse performance requirements for 5G networks, such as data rates, latency, and reliability, to ensure high-quality service delivery	2	4	-	-
	PC11.	evaluate the current capacity of your network infrastructure and identify the areas where scalability is required.	3	2	-	-
	PC12.	analyze the traffic patterns and trends to understand the growth in network demand.	6	2	-	-
	PC13.	develop interoperability standards to ensure seamless communication between different vendors' equipment and network elements	3	4	-	1
	PC14.	determine if the existing hardware and equipment can support the increased traffic demands.	3	-	-	-
	PC15.	implement network monitoring and analytics tools to continuously monitor network performance.	1	3	-	1
	PC16.	identify and troubleshoot network issues, such as latency, packet loss, and throughput.	3	3	-	-

	PC17.	implement Quality of Service (QoS) mechanisms to prioritize critical services and applications, ensuring a consistent and reliable user experience.	3	3	-	1
	PC18.	address regulatory aspects, including compliance with local and international telecommunications regulations and spectrum allocation policies.	-	2	-	1
	Total Marks		**50**	**40**	**-**	**10**
TEL/N4206: Verify and Prepare Hardware Equipment for 5G Installation	**PC1.**	analyse 3GPP standards, budget, architectural, and other design documents as per client specifications.	-	4	-	1
	PC2.	identify the basic parameters of Multiple Input, Multiple Output (MIMO) antenna (diversity gain, MIMO capacity, etc.) for implementation of 5G antenna.	5	4	-	1
	PC3.	ensure that all passive equipment such as antenna (single, dual, triple band, MIMO), feeder, and jumper cable, and all the other necessary equipment are available at the site.	1	4	-	-
	PC4.	ensure that all active equipment such as gNB, microwave link devices, etc. are available at the site.	1	2	-	1
	PC5.	analyse solution life cycle management activities for successful deployment, such as evaluation and impact assessment of the solution and its components, and/or revisions if required.	4	3	-	2
	PC6.	validate that the necessary licenses and permits for installing and operating the hardware equipment at the site have been obtained and are up-to-date.	4	4	-	-
	PC7.	check the availability of weatherproofing and protective enclosures to safeguard the hardware equipment from environmental factors like rain, dust, and extreme temperatures.	2	2	-	1
	PC8.	verify the compatibility and interoperability of the hardware equipment from different vendors to avoid potential integration issues during installation.	3	2	-	-
	PC9.	ensure that any specialized equipment, tools, and accessories required for installation and configuration are available and ready for use.	2	3	-	-
	PC10.	check the availability of required network cables, connectors, and other interconnection components to establish connectivity between different equipment units.	4	2	-	1
	PC11.	confirm the availability of necessary grounding and lightning protection systems to protect the equipment from electrical surges and ensure safety.	2	1	-	-
	PC12.	verify that the power supply and backup power systems (e.g., batteries, generators) are available and sufficient to support the 5G hardware equipment at the site.	5	2	-	-
	PC13.	ensure that the required mounting structures and hardware, such as towers, poles, or rooftop installations, are in place to securely and appropriately mount the antennas and other equipment.	4	2	-	1

	PC14.	conduct a thorough inventory check to confirm that all the hardware equipment items mentioned in the deployment plan are present and accounted for at the site.	4	3	-	1
	PC15.	coordinate with logistics and procurement teams to ensure timely delivery of any missing or additional hardware equipment needed for the installation.	5	-	-	1
	PC16.	inspect the condition and quality of the hardware equipment to ensure it is free from damage or defects before installation.	4	2	-	-
	Total Marks		**50**	**40**	**0**	**10**
TEL/N4207: Design Spectrum and 5G Network Architecture	**PC1.**	analyze spectrum availability and regulations to determine suitable frequency bands for 5g deployment.	2	2	-	-
	PC2.	plan and allocate frequency resources to different services and applications based on their requirements and priority.	4	-	-	2
	PC3.	design 5G network architecture to support dynamic spectrum sharing between different operators and technologies.	-	4	-	1
	PC4.	optimize radio access network (RAN) design to ensure efficient utilization of available spectrum resources.	3	2	-	-
	PC5.	evaluate the impact of interference and propagation characteristics on spectrum allocation and network coverage.	5	-	-	-
	PC6.	implement advanced spectrum management techniques, such as cognitive radio, to enhance spectrum efficiency.	2	2	-	-
	PC7.	insert frequency bands for 5G.	-	2	-	-
	PC8.	deploy the rectified traffic for 5G network.	-	2	-	1
	PC9.	identify suitable sites for installing 5G network equipment, such as base stations or small cells.	3	-	-	1
	PC10.	install and configure the necessary network equipment, including base stations, antennas, and routers, based on the network design and specifications.	2	4	-	-
	PC11.	perform extensive testing of the network to ensure proper functionality, coverage, and capacity	2	3	-	-
	PC12.	familiarize with the capabilities, limitations, and integration requirements of each network type.	4	-	-	-
	PC13.	identify the different network types that need to be integrated and combined, such as cellular, Wi-Fi, satellite, or other specialized networks.	2	2	-	1
	PC14.	evaluate the interoperability of the network types and their compatibility with each other.	4	3	-	-
	PC15.	utilise integration techniques to ensure interoperability and smooth handover between Wi-Fi, and 4G/5G networks.	3	3	-	1
	PC16.	design and optimize network architectures that efficiently combine and utilize different network types to provide seamless connectivity and coverage.	3	4	-	1

	PC17.	implement traffic management techniques, such as Quality of Service (QoS) mechanisms, traffic shaping, and load balancing, to prioritize and allocate resources efficiently based on traffic requirements.	5	4	-	1
	PC18.	address challenges related to network handoff, authentication, and roaming across diverse network architectures	3	2	-	-
	PC19.	use FQDN in the 5G core network to enable efficient and scalable communication between network functions, 5G numbering, addressing services, and devices	3	1	-	1
	Total Marks		**50**	**40**	**0**	**10**
TEL/N4208: Implement the 5G New Radio (NR) and Radio Access	**PC1.**	implement robust network access control mechanisms to prevent unauthorized or irregular data resources from accessing the 5G system.	1	2	-	-
	PC2.	deploy firewalls and intrusion detection/prevention systems (IDS/IPS) to monitor and filter incoming and outgoing traffic.	2	3	-	1
	PC3.	utilize content filtering mechanisms to block access to specific websites, domains, or IP addresses associated with foreign or irregular data resources.	1	3	-	1
	PC4.	employ traffic analysis tools and anomaly detection systems to monitor network traffic patterns and identify irregular or suspicious behavior.	2	2	-	-
	PC5.	implement deep packet inspection (DPI) techniques to analyze packet contents and identify foreign or irregular data resources based on specific protocols, signatures, or patterns.	1	2	-	-
	PC6.	ensure that all network components, including routers, switches, firewalls, and security systems, are regularly updated with the latest security patches and firmware updates.	1	-	-	1
	PC7.	continuously monitor network traffic, security logs, and system events to detect and respond to any attempts to access or distribute foreign or irregular data resources.	1	1	-	-
	PC8.	monitor 5G NR Physical Channels and Signals.	2	1	-	-
	PC9.	acquire specialized monitoring equipment capable of analyzing 5G NR physical channels and signals.	2	1	-	-
	PC10.	use the monitoring equipment to capture the 5G NR physical channels and signals.	-	3	-	-
	PC11.	monitor the different 5G NR physical channels, such as the downlink and uplink channels, control channels, synchronization channels, and reference signals.	1	1	-	-
	PC12.	conduct real-time monitoring of the 5G NR physical channels and signals to capture dynamic changes and fluctuations.	2	2	-	-
	PC13.	analyze the resource allocation and scheduling mechanisms used for downlink transmission.	1	2	-	-
	PC14.	identify and configure BWP Configuration of 5G networking.	-	1	-	-
	PC15.	work with Physical Layer Procedures of 5G networks.	1	-	-	1

	PC16. layer the data signals to Initial Access and Cell Search.	1	1	-	-
	PC17. operate the PSS and SSS Detection.	2	2	-	-
	PC18. capture the received signals using a suitable receiver or monitoring equipment capable of capturing the 5G signals.	1	3	-	1
	PC19. perform a frequency analysis on the captured signals to identify the frequency range where the PSS and SSS signals are expected to be present.	1	3	-	-
	PC20. synchronize the received signals with the expected timing and frame structure of the 5G system.	2	2	-	1
	PC21. implement error handling mechanisms to account for cases where the PSS or SSS signals are weak, corrupted, or not detected correctly.	2	2	-	-
	PC22. continuously validate the accuracy and reliability of the PSS and SSS detection process by monitoring the detected signals and verifying the correctness of the cell identification.	2	2	-	1
	PC23. channel Estimation and Equalization with nodes for 5G connectivity.	1	1	-	1
	PC24. demodulate and decode the backend coding of 5G networks.	1	2	-	-
	PC25. install and rectify Analog Beamforming.	1	2	-	-
	PC26. station and reconstruct Digital Beamforming.	-	2	-	-
	PC27. inspect the Hybrid Beamforming.	1	2	-	-
	PC28. fix beamforming configuration.	1	2	-	-
	PC29. implement 5G in industrial 4.0 such as manufacturing, production, transportation and warehousing	3	-	-	1
	PC30. implement 5G in various sectors such as agriculture, entertainment, smart education and public safety	3	-	-	1
	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		**210**	**200**		**40**

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.

<1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SIP or email
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC
- Assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process & records

2. Testing Environment:

- Check the Assessment location, date and time
- 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.

3. Assessment Quality Assurance levels/Framework:

- Question bank is created by the Subject Matter Experts (SME) are verified by the other SME
- Questions are mapped to the specified assessment criteria
- Assessor must be ToA certified & trainer must be ToT Certified

4. Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- Centre photographs with signboards and scheme specific branding

5. Method of verification or validation:

- Surprise visit to the assessment location

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored

On the Job:

1. Each module (which covers the job profile of Automotive Service Assistant Technician) will be assessed separately.
2. The candidate must score 60% in each module to successfully complete the OJT.
3. Tools of Assessment that will be used for assessing whether the candidate is having desired skills and etiquette of dealing with customers, understanding needs & requirements, assessing the customer and perform Soft Skills effectively:
   - Videos of Trainees during OJT
   -
4. Assessment of each Module will ensure that the candidate is able to:

- Effective engagement with the customers
- Understand the working of various tools and equipment
- …..>

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