QUALIFICATION FILE

IIoT Data Analytics Engineer

☒ 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: 5.5

Submitted By:

Capital Goods and Strategic Skill Council

39,1st Floor, Samyak Tower, Pusa Rd, Block 9A, WEA, Karol Bagh, New Delhi, Delhi, 110005

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Section 1: Basic Details

<table>
<tr><td>1.</td><td>Qualification Name</td><td colspan="2">IIoT Data Analytics Engineer</td></tr>
<tr><td>2.</td><td>Sector/s</td><td colspan="2">Capital goods and Strategic Manufacturing</td></tr>
<tr><td>3.</td><td>Type of Qualification: ☒ New ☐ Revised ☐ Has Electives/Options ☐OEM</td><td>NQR Code & version of existing/previous qualification: (change to previous, once approved)
QG-5.5-CG-02040-2024-V1-CGSC</td><td>Qualification Name of existing/previous version:</td></tr>
<tr><td>4.</td><td>a. OEM Name
b. Qualification Name
(Wherever applicable)</td><td colspan="2">IIoT Data Analytics Engineer</td></tr>
<tr><td>5.</td><td>National Qualification Register (NQR) Code &Version
(Will be issued after NSQC approval)</td><td>QG-5.5-CG-02040-2024-V1-CGSC</td><td>6. NCrF/NSQF Level: 5.5</td></tr>
<tr><td>7.</td><td>Award (Certificate/Diploma/Advance Diploma/ Any Other (Wherever applicable specify multiple entry/exits also & provide details in annexure)</td><td colspan="2">Certificate</td></tr>
<tr><td>8.</td><td>Brief Description of the Qualification</td><td colspan="2">IIoT Data Analytics Engineer facilitate in installation, configuring and connects disruptive sensors and other devices in the industrial IIoT network using LoRaWAN technology, specified optical fibre cables and connectors. He/she develop expertise in data collecting, cleaning, formatting, conditional formatting, data visualization, data consolidation, commissioning and troubleshooting of IIoT systems. The individual skilled engineers can assemble and test simple devices and systems through device prototypes.</td></tr>
<tr><td>9.</td><td>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification & Relevant Experience:
b. Age: 24
<table>
<tr><th>S. No.</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>1.</td><td>UG Degree in relevant field</td><td>3 years of relevant experience</td></tr>
<tr><td>2.</td><td>3 Years UG Degree in Science and Technology (BSc / BCA) / 4 years BE, B.Tech (Electrical, Electronics, Mechanical, Mechatronics, Instrumentation and Control)*</td><td></td></tr>
<tr><td>3.</td><td>10th grade pass +3 years Diploma in relevant field</td><td>4 year of relevant experience</td></tr>
<tr><td>4.</td><td>Previous NSQC level 5</td><td>*Subject to being offered as 6 months internship/ project</td></tr>
</table></td></tr>
</table>

<table>
<tr><td>10</td><td>Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td>19</td><td colspan="2">11. Common Cost Norm Category (I/II/III) (wherever applicable): I</td></tr>
<tr><td>12</td><td>Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)</td><td colspan="3">NA</td></tr>
<tr><td>13</td><td>Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</td><td colspan="3">☐Offline ☐Online ☒Blended
<table>
<tr><th>Training Delivery Modes</th><th>Theory (Hours)</th><th>Practical (Hours)</th><th>OJT Mandatory (Hours)</th><th>OJT Recommended (Hours)</th><th>Total (Hours)</th></tr>
<tr><td>Classroom (offline)</td><td>80</td><td>330</td><td>90</td><td></td><td>570</td></tr>
<tr><td>Online</td><td>70</td><td></td><td></td><td></td><td></td></tr>
</table>
(Refer Blended Learning Annexure for details)</td></tr>
<tr><td>14</td><td>Aligned to NCO/ISCO Code/s (if no code is available mention the same)</td><td colspan="3">2522.0100</td></tr>
<tr><td>15</td><td>Progression path after attaining the qualification (Please show Professional and Academic progression)</td><td colspan="3">Specialized Safety Engineer, Quality Control Specialist</td></tr>
<tr><td>16</td><td>Other Indian languages in which the Qualification & Model Curriculum are being submitted</td><td colspan="3">No</td></tr>
<tr><td>17</td><td>Is similar Qualification(s) available on NQR-if yes, justification for this qualification</td><td colspan="3">☐ Yes ☒ No URLs of similar Qualifications:</td></tr>
<tr><td>18</td><td>Is the Job Role Amenable to Persons with Disability</td><td colspan="3">☐ Yes ☒ No
If “Yes”, specify applicable type of Disability:</td></tr>
<tr><td>19</td><td>How Participation of Women will be Encouraged</td><td colspan="3">The qualification pack empowers women to participate and thereby creating employment and research openings in different sectors</td></tr>
<tr><td>20</td><td>Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)</td><td colspan="3">☐ Yes ☒ No</td></tr>
<tr><td>21</td><td>Is Qualification Suitable to be Offered in Schools/Colleges</td><td colspan="3">Schools ☒ Yes ☐ No Colleges ☒ Yes ☐ No
School: Atal Tinkering labs
College: Atal Incubation, MSME incubation and state incubators</td></tr>
</table>

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: Ms. Shalini Singh** **Email: ceo@cgssc.org** **Contact No.: 9654310244** **Website: www.cgsc.in**	
23	**Final Approval Date by NSQC:** **31st January 2024**	**24. Validity Duration:3years**	**25. Next Review Date: 30 January 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.	Perform Installation and Configuration of IIoT devices and Products	CSC/N 0510 V1.0	Core	5.5	3	20	40	30	-	90	36	64			100	17.10
2.	Collate and Analyze Data arising out of a manufacturing process	CSC/N 0516 V1.0	Core	5.5	3	10	50	30	-	90	40	60			100	17.10
3.	Facilitate in Commissioning and Troubleshooting of IIoT systems	CSC/N 0511 V1.0	Core	5.5	4	30	60	30	-	120	26	74			100	17.10
4.	Assemble and Test Prototype IoT devices	CSC/N 0512 V1.0	Core	5.5	3	40	50	-	-	90	26	74			100	17.10

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)*
5.	Collaboratively coordinate with the team	CSC/N1339 V1.0	Non-Core	5.5	3	20	70	-	-	90	30	70			100	17.10
6.	Follow Health, Safety and Environment at workplace	CSC/N0505 V1.0	Non-core	5	1	10	20	-	-	30	15	20	-	-	35	5.98
7.	Employability Skills (60hrs)	DGT/VSQ/N0102 - Employability Skills (60 hours) v1.0	Non-Core	4	2	20	40	-	-	60	20	30	-	-	50	8.52
.Duration (in Hours) / Total Marks					19	150	330	90		570	193	392			585	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)*	B. Tech in Electrical/ Mechatronics/ Industrial/ Information Technology with 7 years of relevant experience.
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	B. Tech in Electrical/ Mechatronics/ Industrial/ Information Technology with 10 years of relevant experience.
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**	

Section 4: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	B. Tech in Electrical/ Mechatronics/ Industrial/ Information Technology with 7 years of relevant experience.
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	B. Tech in Electrical/ Mechatronics/ Industrial/ Information Technology with 7 years of relevant experience.
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	B. Tech in Electrical/ Mechatronics/ Industrial/ Information Technology with 10 years of relevant experience.
4.	**Assessment Mode** *(Specify the assessment mode)*	Offline
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):** No
2.	**Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):** No

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:** 815
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** *Yes* If "No", why:

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)*	*Annexure: Evidence of Level*
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	*Annexure: Tools and Equipment (Lab Set-Up)*
3.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	*Annexure: Detailed Assessment Criteria*
4.	**Annexure:** Assessment Strategy *(Mandatory)*	*Annexure: Assessment Strategy*
5.	**Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is "Blended Learning")*	
6.	**Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification has multiple Entry-Exit)*	
7.	**Annexure:** Acronym and Glossary *(Optional)*	*Annexure: Acronym and Glossary*
8.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	*MC_CG IIoT Data Analytics Engineer*
9.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	*Summary sheet*
10.	**Supporting Document:** Occupational Map *(Mandatory)*	*Occupational Mapping*
11.	**Supporting Document:** Assessment SOP *(Mandatory)*	*Attached in MC_CG IIoT Data Analytics Engineer*
12.	**Any other document you wish to submit:**	

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	•Integrate advanced technologies like IoT, AI, and data analytics to enhance overall efficiency and productivity. •Demonstrate expertise in architecting systems that optimize operational efficiency and reduce downtime. •Monitor and fine-tune automated processes to continuously enhance desired outcomes. •Tailor IIOT solutions to specific industrial needs, optimizing performance and ensuring seamless integration with existing systems. •Develop and implement data collection strategies using sensors and devices to gather relevant information. •Facilitate capacity building programs to ensure the workforce is equipped with the necessary skills to leverage new technologies effectively. •Act as a technology evangelist, promoting the adoption of emerging technologies within the organization. •Implement and enforce robust health, safety, and environmental practices within the workplace.	As can be inferred from the learning outcomes and performance criteria of the Qualification listed in the adjacent cell, the IIoT Data Analytics Engineer requires well developed skill, with clear choice of procedures in familiar context. Hence NSQF level for this descriptor is 5.5.	5.5

Professional and Technical Skills/ Expertise/ Professional Knowledge	• Understanding of Industry 4.0 concepts and practices. • Familiarity with global trends in manufacturing, particularly as they relate to data analytics in the target organization. • Digital manufacturing concepts and practices • Understanding the architectures of a digital factory and how data analytics can enhance its efficiency • Role of customers and vendors in a connected factory • Ability to leverage data analytics for improved customer engagement and vendor relationships • Understanding the importance of Cybersecurity in the context of data analytics in Industry 4.0. • Implementation of cybersecurity measures to safeguard data and analytics systems. • Awareness of the vision, goals, products, and services of the organization.	As can be inferred from the knowledge and understanding related points mentioned in the adjacent cell, which have been taken from the IIoT Data Analytics Engineer qualification pack, job role holder must have a knowledge of facts, principles, processes and general concepts, in a field of work or study Hence NSQF level for this descriptor is 5.5.	5.5

	• Understanding the production design methodology and product lifecycle for effective data analytics integration • Knowledge of production planning methods and tools used in the organization. • Understanding how data analytics can contribute to optimized production planning and execution • Familiarity with tools and applications relevant to digital manufacturing, with a focus on data analytics tools. • Technical skills relating to various technologies relevant to data analytics in the organization. • Hands-on skills in using tools and applications employed in digital manufacturing, emphasizing proficiency in data analytics applications.		
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	• Communication Skill • Administrative skills • Decision Making • Planning • Mathematical Skills • Supervisory skills • Coordinating skills • Digital skills	As can be inferred from the knowledge and understanding related points mentioned in the adjacent cell, which have been taken from the IIoT Data Analytics Engineer qualification pack, job role holder must have a knowledge of facts, principles, processes, and general concepts, in a field of work	5.5

		or study Hence NSQF level for this descriptor is 5.5.	
Broad Learning Outcomes/Core Skill	• Communication Skills • Decision Making • Planning • Mathematical Skills • Digital skills	As can be inferred from the knowledge and understanding related points mentioned in the adjacent cell, which have been taken from the IIoT Data Analytics Engineer qualification pack, job role holder must have a knowledge of facts, principles, processes, and general concepts, in a field of work or study.	5.5
Responsibility	• Perform Installation and Configuring IIoT devices and Products • Facilitate in Commissioning and Troubleshooting of IIoT systems • Assemble and Test Prototype IoT devices	As can be inferred from the knowledge and understanding related points mentioned in the adjacent cell, the IIoT Data Analytics Engineer must take responsibility for own work and learning and some responsibility for others' works and learning. Hence NSQF level for this descriptor is 5.5.	5.5

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.	IoT Development Kits	Raspberry Pi or Arduino kits	15

2.	Computers/Laptops	Intel Core i5 or equivalent, 8GB RAM, 256GB SSD, and Wi-Fi capability	15
3.	Sensors and Actuators	Various sensors (temperature, humidity, pressure, etc.) and actuators	15 each
4.	IoT Gateways	Intel IoT Gateway	1
5.	Industrial PLC	Siemens SIMATIC S7-1200	10
6.	Edge Computing Device	NVIDIA Jetson Nano	5
7.	Cloud Platforms	AWS IoT, Microsoft Azure IoT, or Google Cloud IoT	15
8.	IIoT Analytics Software	ThingWorx, Predix	10
9.	Data Analytics Tools	Python (NumPy, Pandas, Scikit-learn), R, MATLAB	15
10.	Database Systems	MongoDB, InfluxDB, or MySQL	15
11.	Communication Protocols	MQTT, CoAP, OPC UA	15
12.	Networking Equipment	Routers, switches, and cables	10 each
13.	Security Tools	Wireshark, Kali Linux	10
14.	Simulation Software	Simulink, LabVIEW	10

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Laptop
2. Projector
3. Cloud access
4. Learning management system

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.	Maxbyte Technologies Private Limited	Mr. Sabarinathan D	Chief Innovation & Products	4th Floor, No – 218, Cowley Brown Road, R.S Puram, Coimbatore– Tamil Nadu, India	9786422542	dss@maxbytetech.com	

2.	JBM Auto Limited	Mr. Rajeev Kumar Sharma	AVP-Head Skill Development	Plot No. 16, Sector 20B, Faridabad – 121007	8860281177	rajeev.sharma@jbmgroup.com	
3.	Indian Machine Tool Manufacturers' Association	Mr. P. J. Mohanram	Principal Advisors	10th Mile, Tumkur Road, Madavara Post, Bangalore – 562123	8066246600	Imtma@imtma.in	
4.	Indian Textile Accessories & Machinery Manufacturers' Association	Mr. N D Mhatre	Director General (Tech)	Bhogilal Hargovindas Bldg., 4th Floor, 18/20, K. Subhash Marg, Kala Ghoda, Mumbai – 400001	02222844350	Info@itamma.org	
5.	Plastics Machinery Manufacturers' Association of India	Mr. Mahendra Patel	Chairman	New Delhi YMCA Tourist Hotel, Gate No.1, 1st Floor, Jai Singh Road, Delhi – 110001	01143586061	Info@pmmai.org	
6.	Parametric Technology (India) Pvt. Ltd.	Mr. Rajkiran C	Senior Director (IIoT & AR technologies)	Level 6, Nitesh Timesquare. #8 MG Road, Bengaluru – 560001	8066734300	amarathe@ptc.com	
7.	TVS Motor Company	Dr. S. Devarajan	Sr. Vice President (Advanced Manufacturing)	P.B. No. 4, Harita, Hosur - 635109	+91 (4344) 276780	Contactus@tvsmotor.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
2024	257	183	85	59	6	4

2025	282	192	95	69	9	6
2026	291	204	145	105	11	8

Data to be provided year-wise for next 3 years

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

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

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:

1.
2.

Content availability for previous versions of qualifications:

☐ Participant Handbook ☐ Facilitator Guide ☐ Digital Content ☐ Qualification Handbook ☐ Any Other:

Languages in which Content is available:

Annexure: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

Refer NCVET "Guidelines for Blended Learning for Vocational Education, Training & Skilling":

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	Laptop, Projector, Projecting Screen and LMS.	1:1
2	☐Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	Laptop, Projector, Projecting Screen and LMS.	1:1
3	☐Showing Practical Demonstrations to the learners	As per tool list attached	NA
4	☐Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	As per tool list attached	NA
5	☐Tutorials/ Assignments/ Drill/ Practice	As per tool list attached	NA
6	☐Proctored Monitoring/ Assessment/ Evaluation/ Examinations	As per tool list attached	NA
7	☐On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	As per tool list attached	NA

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
Perform Installation and Configuring IIoT devices and Products **CSC/N0510 V1.0**	*Preparing for Installation configuring IIoT devices and sensors*	9	16	-	-
	PC1. get the list of sensors and other devices to install and their locations			-	-
	PC2. get the installation drawings and instructions for each sensor or device – including wiring and interconnection list and diagram			-	-
	PC3. read the drawing and instructions and ensure that you understand – else seek clarifications and clarify all doubts			-	-

	PC4. prepare a list of all parts and accessories required for the installation			-	-
	PC5. collect all sensors, devices, cables, and other accessories required for the installation			-	-
	PC6. inform the person in-charge of the site (whether belonging to your company or the client) and take permission to do the installation			-	-
	PC7. inspect the site and ensure that the site is ready for installation – in particular, check that the equipment on which sensors or devices are to be fitted are in place and are available for fitting			-	-
	PC8. perform any site preparations – identify, verify and mark installation location and equipment on drawing, mark locations of holes for support members, drill correct size holes, mark cable entry and exit points, mounting and routing of cable reliefs, cable trays, cable trenches etc.			-	-
	Installing Devices	**9**	**16**	-	-
	PC9. install brackets and other hardware for supporting the sensors or devices according to installation drawings, using approved accessories and hardware			-	-
	PC10. install securely sensors or devices according to installation drawings on the equipment or support members as specified in the drawings			-	-
	PC11. follow specified procedure for mounting of sensor on the equipment – such as inserting the sensor inside the equipment to correct depth or mounting it on a specified surface using specified mounting hardware and using any surfactant compound (such as thermal grease etc.).			-	-
	PC12. install wireless sensors following specified procedure, ensuring proper connection of power source or battery and correct orientation of antenna.			-	-
	PC13. fix any labels, tags, or other markings to identify the devices			-	-
	PC14. cross check installed devices with list provided for correct location, orientation, and any other distinguishing features			-	-
	Interconnecting Devices Using Specified Cables and Accessories	**9**	**16**	-	-

	PC15. prepare specified wires and cables of required lengths using recommended practices and terminate on plugs, pins, connectors etc. as specified in drawings – for each sensor or input device to the destination device or junction box.			-	-
	PC16. use fiber optic cable of correct types, sizes, and lengths for optical connections.			-	-
	PC17. follow specified procedures and protection devices for laying fiber cables and ensure minimum bending radius guidelines			-	-
	PC18. follow colour codes, labelling and ferruling practices for all wires and cables			-	-
	PC19. use industry best practices for installation or wiring where detailed instructions are missing			-	-
	PC20. run wires and cables through the cable entry and exit points, routing via specified cable hose, tray, trench etc. and bring them to the target junction boxes, sensors, or devices, control panels, PLCs etc.			-	-
	PC21. use appropriate cable glands, cable ties, clips, clamps or other specified strain relief or protection device.				
	PC22. connect the wire and cable ends to sensors and devices as specified in connection list				
	PC23. follow wiring procedure specified for any Fieldbus devices – consisting of sensors, devices, junction boxes, terminators, power conditioner and host controller. These are normally connected using shielded twisted copper pair connections				
	PC24. follow wiring procedure specified for any Power Over Ethernet (PoE) connected sensors, devices, terminators, power conditioner and controller, which are normally connected using CAT5/CAT6 wires of specified gauges for the intended length				
	PC25. connect PoE types of powered devices (PDs) to Ethernet networks using specified CAT5 or CAT6 cables and RJ45 connectors following recommended procedure. Such devices include IP surveillance cameras, 802.11ac and 802.11ax access points, LED luminaires, 5G small cells, VoIP phones, and other IoT appliances				
	PC26. ensure correct connection type - T568A or T568B - for all PoE devices as specified in the connection diagram				
	PC27. terminate optical fiber cables on specified connectors using appropriate cutting, stripping and termination tools				

	Verifying Installation and Interconnection	**9**	**16**	-	-
	PC28. verify that all screws are tightened with correct torque and the devices are rigidly mounted to withstand any expected vibration, wind velocity and operational handling				
	PC29. verify that devices do not physically interfere with other equipment or wiring and have specified environmental protection, dust covers, orientation and access				
	PC30. verify all connections for physical integrity, labelling, colour coding and compliance with the connection list				
	PC31. verify correct termination of shields and ground connections				
	PC32. perform DC continuity check and verify all connections with the connection list				
	PC33. confirm that DC resistance is within specified limits where applicable				
	PC34. verify insulation resistance of cables and connections using insulation tester, where applicable				
	PC35. verify integrity of fiber optic connections using appropriate tools. Verify minimum bending radius guidelines.				
	PC36. prepare installation report in prescribed format and submit to authorized persons				
	Total Marks	**36**	**64**		
Collate and analyze Data arising out of a manufacturing process CSC/N0516 V1.0	*Collate and analyze Data arising out of a manufacturing process*				
	PC1. collect data from various sources such as sensors, PLCs, SCADA systems, and databases.				
	PC2. Ensuring high data quality by implementing processes for data cleaning, normalization, and validation.				
	PC3. utilizing statistical analysis techniques and machine learning algorithms to derive actionable insights from manufacturing data.				
	PC4. identify patterns, trends, and correlations relevant to optimizing manufacturing processes.				
	PC5. Demonstrate accuracy and reliability of predictive models developed for forecasting equipment failures, predicting production outputs, or optimizing process parameters.				

	PC6. Create clear and informative visualizations, dashboards, and reports to communicate insights effectively.				
	PC7. Design visualizations that are intuitive and actionable for decision-makers across different levels of the organization.				
	PC8. conduct root cause analysis to identify factors contributing to manufacturing inefficiencies, defects, or downtime.				
	PC9. Ensure compliance with data privacy regulations (e.g., GDPR, HIPAA) and industry-specific standards (e.g., ISO 9001, IEC 62443) in data handling and analysis.				
	PC10. Implement best practices for data governance, access control, and audit trails to maintain data integrity and security.				
	Total Marks	40	**60**		
Facilitate in Commissioning and Troubleshooting of IIoT systems CSC/N0511 V1.0	*Verifying integrity of physical connections*	10	24		
	PC1. refer to the interconnection diagram and wiring list for the location and identify each sensor and device in the network				
	PC2. perform a physical verification of the installation and confirm that installation conforms to specified standards and interconnection list and that the installation is neat, uncluttered, and safe				
	PC3. verify installation done by someone else – who may or may not be a part of your team				
	PC4. identify and correct installation issues such as improper mechanical support, cable routing, cable termination, strain relieving, shielding, use of cable glands				
	PC5. identify and correct issues such as improper cable marking, labelling, ferruling etc.				
	PC6. identify and correct unused, unterminated, or missing cable connections issues				
	PC7. report any missing, damaged, or tampered component to the site in-charge				
	Tracing and troubleshooting connection problems	8	24		
	PC8. use tools for checking network configuration and connectivity – such as cable break detector, etc.				
	PC9. determine the expected impedance and voltage at each network point and device pin in the wiring list				
	PC10. check impedance, voltage, or other parameters at identified points using specified tools and verify that the signal is proper and within limits				

	PC11. follow instructions of commissioning personnel regarding any connection problem and perform the tasks necessary to resolve it				
	Providing help in setting up test systems and testing	8	26		
	PC12. follow instructions of commissioning personnel to set up the test systems				
	PC13. follow electrical, electronic, mechanical, and other safety requirements and procedure				
	PC14. use protective gear and tools – such as helmets, goggles, proper gloves, shoes etc. required for the task				
	PC15. read and report instrument data as instructed				
	PC16. follow instructions regarding loop testing				
	PC17. perform any changes or modifications to the installation as instructed and record the changes in appropriate documents				
	PC18. perform disconnection of the test setup, restore normal connections and any clean up when instructed				
	PC19. provide support to the commissioning team in performing user acceptance test				
	Total Marks	26	74		
Assemble and Test Prototype IoT devices CSC/N0512 V1.0	*Collecting assembly documents and parts*	6	24		-
	PC1. collect the design documents and understand the assembly and test procedure				-
	PC2. verify that circuit diagram, BOM and assembly instructions are clear and complete				-
	PC3. use recommended ESD protected work bench, wrist band and grounding procedure				-
	PC4. collect all parts for the design according to BOM				-
	PC5. confirm that all tools required for assembly are available – including soldering and desoldering tools, SMD soldering tools such as hot air blower, hot tweezer etc., PCB holder, magnifier, illumination lamp, flux liquid or paste, tweezer, pliers, cutters, cleaning solvent, brush etc.				-
	PC6. report any missing, damaged, or spare components or tools to supervisor and get missing parts and clarifications				-
	Performing assembly of PCB and enclosure	7	24		-

	PC7. set correct temperature for normal or SMD soldering tools. Set correct air flow rate for SMT soldering.				-
	PC8. perform assembly of electronic parts on the PCB taking care of the correct orientation of part on the PCB, according to layout and following industry best practices				-
	PC9. verify correctness of assembly and ensure that there are no unused parts or shortages				-
	PC10. clean the assembled PCB using recommended solvent and dry the PCB following recommended procedure				-
	PC11. prepare required cables, connectors, harnesses etc. using recommended wires, accessories, and tools				-
	PC12. mount components on the chassis, enclosure, box etc. per given design				-
	PC13. solder chassis components and plug cables in appropriate places				-
	Performing testing and reporting	**13**	26		
	PC14. confirm availability of appropriate testing tools such as power supply, signal generator, oscilloscope, dc voltage reference etc. for testing as specified and verify that these are in good working conditions				-
	PC15. perform visual check to verify current location, orientation, and polarity of all components on the PCB and chassis				-
	PC16. use fuse links of appropriate ratings				-
	PC17. use appropriate power supply to power the device				-
	PC18. ensure that the required connectivity is available and credentials are provided for testing wireless or internet connected devices				-
	PC19. identify critical gaps in skills and workforce mix to meet the organization goals for Industry 4.0				-
	PC20. note any unusual heating of parts, smoke or burning smell – if found, switch off power supply immediately and investigate				-
	PC21. record observations and test results in prescribed format				

	PC22. cross check any failed tests with instructions and verify that the test result is correct				
	PC23. consult supervisor or test engineer for any clarifications – especially if there are any failed tests, failed component or in consistent data				
	PC24. switch off all instruments and clean up the work bench on completion of test				
	PC25. follow safety norms and practices and report any non-compliance				
	Total Marks	**26**	**44**		
Collaboratively coordinate with the team CSC/1339 V1.0	*Communicate effectively at the workplace*	8	20	-	-
	PC1.exchange information and instruction with colleagues, and seek clarifications and feedback			-	-
	PC2.assist colleagues where required			-	-
	PC3.follow business communication etiquette in all interactions and communicative formats (online, digital, and in-person)			-	-
	PC4.document and share all relevant information with stakeholders in agreed formats and as per agreed timelines				
	Work effectively	8	15	-	-
	PC5.identify and obtain clarity regarding organizational, team and own goals and targets			-	-
	PC6.prioritise and plan work in order to achieve goals and targets			-	-
	PC7.monitor own and team performance as per agreed plan			-	-
	PC8.complete duties accurately, systematically and within required timeframes			-	-
	PC9.express emotions appropriately at the workplace and manage own response to heightened emotions			-	-
	PC10.maintain orderliness and cleanliness in the work area Maintain and enhance professional competence			-	-
	PC11.identify own strengths and weaknesses in relation to goals and targets			-	-
	PC12.adapt self, service, or product to meet success criteria			-	-
	PC13.seek and select opportunities for continuous professional development			-	-
	PC14.formulate a professional development plan to enhance capabilities			-	-

	PC15.build or contribute to the organizational knowledge base of cases, clients, issues, solutions, and innovations			-	-
	PC16.examine developments and trends in field of work and their potential impact on work			-	-
	PC17.take feedback from peers, supervisors and clients to improve own performance and practices			-	-
	Work in a disciplined and ethical manner	7	15	-	-
	PC18.perform tasks as per workplace standards, organizational policies and legislative requirements			-	-
	PC19.display appropriate professional appearance at the workplace and adhere to the organizational dress code			-	-
	PC20.demonstrate responsible and disciplined behavior at the workplace such as punctuality; completing tasks as per given time and standards; demonstrating professional behavior at all times, adopting environment-friendly practices, etc.			-	-
	PC21.identify the cause of conflict and options for resolution with peers or escalate grievances and problems to appropriate authority as per procedure for conflict resolution			-	-
	PC22.protect the rights of the client and organization when delivering services				
	PC23.ensure services are delivered equally to all clients regardless of personal and cultural beliefs				
	PC24.operate within an agreed ethical code of practice and report unethical conduct to the appropriate authorities				
	PC25.follow organizational guidelines and legal requirements on disclosure and confidentiality				
	Uphold social diversity at the workplace	7	20		
	PC26.recognize and evaluate biased practices against underrepresented groups like women and persons with disabilities, in workplace systems and processes				
	PC27.identify and report discrimination and harassment based on gender, disability, or cultural difference at the workplace				
	PC28.use inclusive or neutral language and gestures in all interactions				
	PC29.respect the personal and professional space of others				

	PC30.access grievance redressal mechanisms as per legislations				
	Total Marks	**30**	**70**		
Follow safety, health and environment guidelines at workplace CSC/N0505 V1.0				-	-
	PC1.exchange information and instruction with colleagues, and seek clarifications and feedback				
	PC2.assist colleagues where required			-	-
	PC3.follow business communication etiquette in all interactions and communicative formats (online, digital, and in-person)			-	-
	PC4.document and share all relevant information with stakeholders in agreed formats and as per agreed timelines				
	Work effectively			-	-
	PC5.identify and obtain clarity regarding organizational, team and own goals and targets			-	-
	PC6.prioritise and plan work in order to achieve goals and targets			-	-
	PC7.monitor own and team performance as per agreed plan			-	-
	PC8.complete duties accurately, systematically and within required timeframes			-	-
	PC9.express emotions appropriately at the workplace and manage own response to heightened emotions			-	-
	PC10.maintain orderliness and cleanliness in the work area Maintain and enhance professional competence			-	-
	PC11.identify own strengths and weaknesses in relation to goals and targets			-	-
	PC12.adapt self, service, or product to meet success criteria			-	-
	PC13.seek and select opportunities for continuous professional development			-	-
	PC14.formulate a professional development plan to enhance capabilities			-	-
	PC15.build or contribute to the organizational knowledge base of cases, clients, issues, solutions, and innovations			-	-
	PC16.examine developments and trends in field of work and their potential impact on work			-	-
	PC17.take feedback from peers, supervisors and clients to improve own performance and practices			-	-
	Work in a disciplined and ethical manner			-	-

	PC18.perform tasks as per workplace standards, organizational policies and legislative requirements			-	-
	PC19.display appropriate professional appearance at the workplace and adhere to the organizational dress code			-	-
	PC20.demonstrate responsible and disciplined behavior at the workplace such as punctuality; completing tasks as per given time and standards; demonstrating professional behavior at all times, adopting environment-friendly practices, etc.			-	-
	PC21.identify the cause of conflict and options for resolution with peers or escalate grievances and problems to appropriate authority as per procedure for conflict resolution			-	-
	PC22.protect the rights of the client and organization when delivering services			-	-
	PC23.ensure services are delivered equally to all clients regardless of personal and cultural beliefs			-	-
	PC24.operate within an agreed ethical code of practice and report unethical conduct to the appropriate authorities			-	-
	PC25.follow organizational guidelines and legal requirements on disclosure and confidentiality			-	-
	Uphold social diversity at the workplace			-	-
	PC26.recognize and evaluate biased practices against underrepresented groups like women and persons with disabilities, in workplace systems and processes			-	-
	PC27.identify and report discrimination and harassment based on gender, disability, or cultural difference at the workplace			-	-
	PC28.use inclusive or neutral language and gestures in all interactions			-	-
	PC29.respect the personal and professional space of others			-	-
	PC30.access grievance redressal mechanisms as per legislations			-	-
	PC32. escalate the leakage issue to appropriateauthority if needed			-	-
	PC33. carry out routine cleaning of tools, machines, and equipment and maintain them in good working condition to optimize efficiency andwastage			-	-
	PC34. check if the equipment is functioning normally before commencing work and rectify orreport any malfunctioning to the responsible agency			-	-

	PC35. check for any odour, sparks, fumes, emission, unusual vibration, noise, or any otherobjectionable presence in the environment andtake immediate corrective action followed by report to responsible agency			-	-
	PC36. ensure electrical equipment are properly connected for use and are switched off when not inuse			-	-
	PC37. support education and compliance ofresource conservation processes			-	-
	Total Marks	**15**	**20**		
Employability Skills (60 Hours) **DGT/VSQ/N0102 -Employability Skills V1.0**	*Introduction to Employability Skills*	**1**	**1**	-	-
	PC1. identify employability skills required for jobsin various industries	-	-	-	-
	PC2. identify and explore learning andemployability portals	-	-	-	-
	Constitutional values – Citizenship	**1**	**1**	-	-
	PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. andpersonal 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 CenturySkills 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 conversationin 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-mailsetc. in English	-	-	-	-
	Career Development & Goal Setting	**1**	**2**	-	-

	PC10. understand the difference between job andcareer	-	-	-	-
	PC11. prepare a career development plan withshort- 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 appropriatelywith 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 andservices as per requirement	-	-	-	-
	PC17. carry out offline and online financialtransactions, safely and securely	-	-	-	-
	PC18. identify common components of salary andcompute income, expenses, taxes, investments etc	-	-	-	-
	PC19. identify relevant rights and laws and uselegal aids to fight against legal exploitation	-	-	-	-
	Essential Digital Skills	**3**	**4**	-	-
	PC20. operate digital devices and carry out basicinternet operations securely and safely	-	-	-	-
	PC21. use e- mail and social media platforms andvirtual collaboration tools to work effectively	-	-	-	-
	PC22. use basic features of word processor,spreadsheets, and presentations	-	-	-	-
	Entrepreneurship	**2**	**3**	-	-
	PC23. identify different types of Entrepreneurshipand 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, andmitigate 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 requestsand needs in a professional manner.	-	-	-	-
	PC28. follow appropriate hygiene and groomingstandards	-	-	-	-
	Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
	PC29. create a professional Curriculum vitae(Résumé)	-	-	-	-
	PC30. search for suitable jobs using reliable offlineand 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 andconfidence, during recruitment and selection	-	-	-	-
	PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
	Total Marks	**20**	**30**		
Grand Total		**193**	**392**		90

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