



QUALIFICATION FILE

PLC Technician (Advanced)

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

☐ Upskilling ☐ Dual/Flexi Qualification ☒ For ToT ☒ For ToA

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

NCrF/NSQF Level: 5

Submitted By:

Indian Iron and Steel Sector Skill Council (IIS SSC)

Karigari Bhawan, 5th Floor,

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Rajarhat, Kolkata-700160

Table of Contents

Section 1: Basic Details	3
Section 2: Module Summary	5
NOS/s of Qualifications	5
Mandatory NOS/s:	5
Elective NOS/s:	5
Optional NOS/s:	6
Assessment - Minimum Qualifying Percentage	6
Section 3: Training Related	6
Section 4: Assessment Related	6
Section 5: Evidence of the need for the Qualification	7
Section 6: Annexure & Supporting Documents Check List	7
Annexure: Evidence of Level	8
Annexure: Tools and Equipment (Lab Set-Up)	9
Annexure: Industry Validations Summary	10
Annexure: Training & Employment Details	11
Annexure: Blended Learning	13
Annexure: Detailed Assessment Criteria	14
Annexure: Assessment Strategy	23
Annexure: Acronym and Glossary	24

Section 1: Basic Details

1.	Qualification Name	PLC Technician (Advanced)													
2.	Sector/s	Iron and Steel													
3.	Type of Qualification: ☒ New ☐ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of existing/previous qualification: (change to previous, once approved)	Qualification Name of existing/previous version: PLC Technician (Advanced) / v1.0												
4.	a. OEM Name b. Qualification Name (Wherever applicable)														
5.	National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval)	QG-05-IS-04235-2025-V1-IISSSC	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	A PLC technician is responsible for controlling various processes of industries involving development, testing and commission the PLC, HDMI and SCADA program, finding errors, if any, and then fixing the errors or faults, during the operation of the plant.													
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience: <table border="1"> <thead> <tr> <th>S. No.</th> <th>Academic/Skill Qualification (with Specialization - if applicable)</th> <th>Required Experience (with Specialization - if applicable)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>12th grade pass or equivalent</td> <td></td> </tr> <tr> <td>2</td> <td>12th grade pass with 2 year of NTC/NAC in Fitter, Machinist, Electronics, Electrical and Instrumentation</td> <td>1 year experience in relevant field</td> </tr> <tr> <td>3</td> <td>12th grade pass</td> <td>2 year experience in relevant field</td> </tr> </tbody> </table> b. Age: 18 years		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	12 th grade pass or equivalent		2	12th grade pass with 2 year of NTC/NAC in Fitter, Machinist, Electronics, Electrical and Instrumentation	1 year experience in relevant field	3	12th grade pass	2 year experience in relevant field
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)													
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2	12th grade pass with 2 year of NTC/NAC in Fitter, Machinist, Electronics, Electrical and Instrumentation	1 year experience in relevant field													
3	12th grade pass	2 year experience in relevant field													
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)	NA													

13.	Training Duration by Modes of Training Delivery (<i>Specify Total Duration as per selected training delivery modes and as per requirement of the qualification</i>)	☒ Offline ☐ Online ☐ Blended <table border="1" data-bbox="1030 127 2128 295"> <thead> <tr> <th>Training Delivery Modes</th> <th>Theory (Hours)</th> <th>Practical (Hours)</th> <th>OJT Mandatory (Hours)</th> <th>OJT Recommended (Hours)</th> <th>Total (Hours)</th> </tr> </thead> <tbody> <tr> <td>Classroom (offline)</td> <td>154:00</td> <td>266:00</td> <td>150:00</td> <td></td> <td>570</td> </tr> <tr> <td>Online</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <i>(Refer Blended Learning Annexure for details)</i>						Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	154:00	266:00	150:00		570	Online					
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)																				
Classroom (offline)	154:00	266:00	150:00		570																				
Online																									
14.	Aligned to NCO/ISCO Code/s (<i>if no code is available mention the same</i>)	NCO-2015/8212.2002																							
15.	Progression path after attaining the qualification (<i>Please show Professional and Academic progression</i>)	PLC system Supervisor Level – 5.5																							
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	No gender sensitization																							
20.	Are Greening/ Environment Sustainability Aspects Covered (<i>Specify the NOS/Module which covers it</i>)	☐ 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 (<i>In case of CS or MS, provide details of both Lead AB & Supporting ABs</i>)	Name: Mr. Sushim Banerjee Email: ceo@iisssc.org/ sushim_banerjee@yahoo.com Contact No.: 033-23247559 Website: https://www.iisssc.org/																							
23.	Final Approval Date by NSQC: 08.05.2025	24. Validity Duration: 3 Years				25. Next Review Date: 08.05.2028																			

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.	Manage and implement health and safety practices at the work place	ISC/N0946, v1.0	Non-Core	2	2	25	35	00		60	30	50	00	20	100	10
2.	Perform development of PLC program	ISC/N2001, v1.0	Core	5	1	10	20	00		30	30	50	00	20	100	20
3.	Develop HMI/SCADA application	ISC/N2002, v1.0	Core	5	3	30	60	00		90	30	50	00	20	100	20
4.	Perform installation and commissioning of PLC system	ISC/N2003, v1.0	Core	5	4	45	75	00		120	30	50	00	20	100	25
5.	Perform repairing and maintenance of PLC systems	ISC/N2004, v1.0	Core	5	2	20	40	00		60	30	50	00	20	100	15
6.	Employability Skills (60 Hours)	DGT/VSQ/N0102	Non-core	5	2	24	36	00		60	20	30	00	00	50	10
7.	OJT		Core	5	5			150		150						
Duration (in Hours) / Total Marks					19	154	266	150		570	170	280	00	100	550	100

Elective NOS/s:

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.																
2.																
Duration (in Hours) / Total Marks																

Optional NOS/s:

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.																
2.																
Duration (in Hours) / Total Marks																

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)	Diploma (In relevant field) with 5 years of industry and 1 year of training experience in PLC installation and commissioning Or B.Tech (In relevant field) with 3 years of industry and 1 year of training experience in PLC installation and commissioning
2.	Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	B.Tech (In relevant field) with 6 years of industry and 2 years of training experience in PLC installation and commissioning
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)	Diploma (In relevant field) with 5 years of industry and 1 year of assessment experience in PLC installation and commissioning Or
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		B.Tech (In relevant field) with 3 years of industry and 1 year of assessment experience in PLC installation and commissioning
2.	Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	B.Tech (In relevant field) with 5 years of industry and 2 years of assessment experience in PLC installation and commissioning
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	B.Tech (In relevant field) with 7 years of industry and 2 years of assessment experience in PLC installation and commissioning
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): 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: 20
5.	Estimated nos. of persons to be trained and employed: 500
6.	Evidence of Concurrence/Consultation with Line Ministry/State Departments: In progress 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)	Attached
2.	Annexure: List of tools and equipment relevant for qualification (Mandatory, except in case of online course)	Attached
3.	Annexure: Detailed Assessment Criteria (Mandatory)	Attached
4.	Annexure: Assessment Strategy (Mandatory)	Attached

5.	Annexure: Blended Learning (<i>Mandatory, in case selected Mode of delivery is “Blended Learning”</i>)	NA
6.	Annexure: Multiple Entry-Exit Details (<i>Mandatory, in case qualification has multiple Entry-Exit</i>)	Filled
7.	Annexure: Acronym and Glossary (<i>Optional</i>)	
8.	Supporting Document: Model Curriculum (<i>Mandatory – Public view</i>)	Attached
9.	Supporting Document: Career Progression (<i>Mandatory - Public view</i>)	Attached
10.	Supporting Document: Occupational Map (<i>Mandatory</i>)	Attached
11.	Supporting Document: Assessment SOP (<i>Mandatory</i>)	Attached
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	Performs various activities related to controlling various processes of industries involving development, testing and commission the PLC, HDMI and SCADA program, finding errors, if any, and then fixing the errors or faults, during the operation of the plant.	Person may carry out a job which may require limited range of activities routine and predictable. This level 5	5
Professional and Technical Skills/ Expertise/ Professional Knowledge	- Identify the requirements for the PLC application - Develop a PLC program - Test and verify PLC program - Identify the requirements for the HMI/SCADA application - Develop an HMI/SCADA application - Test and verify HMI/SCADA application - Prepare for installation activities - Installation and integration of PLC control systems - Commissioning of PLC control systems - Maintenance of PLC systems - Troubleshooting and repairing of faults in PLC systems	Basic facts, process and principle applied in trade of employment and hence is level 5.	5

Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	Attaching utmost importance to safety, maintenance and operations of PLC, HMI and SCADA system	Demonstrate practical skill, routine and repetitive in narrow range of application and Hence this is level 5	5
Broad Learning Outcomes/Core Skill	Reading and writing; addition, subtraction; hygiene and environment.	Communication written and oral, with minimum required clarity, skill of basic arithmetic and algebraic principles. Hence this is level 5	5
Responsibility	Responsible for completing the repetitive assigned task, working under guidance of supervisor/senior technician	Under close supervision. Some responsibility for own work within defined limit and hence level 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	Programmable Logic Controllers (PLCs)	As per requirement	5
2	SCADA Software	As per requirement	5 licenses
3	Human-Machine Interface (HMI) Devices	As per requirement	5
4	Various sensors (proximity sensors, pressure sensors, temperature sensors) and actuators for feedback and control	As per requirement	5 set
5	Communication Modules	As per requirement	5 set
6	Networking Equipment (Network switches, routers, and cables)	As per requirement	5 set
7	Programmable Automation Controllers (PACs)	As per requirement	5
8	Electrical Testing Tools (Multi meters, oscilloscopes, and other electrical testing equipment for system diagnostics)	As per requirement	5 set
9	PLC Programming Software	As per requirement	5 licenses
10	SCADA Development Tools	As per requirement	5 set
11	CAD Software	As per requirement	1
12	Industrial Computers	As per requirement	5
13	Personal protective equipment (PPE)	As per requirement	30 sets
14	Cable Management Systems (Cable trays, conduits, and other cable management solutions)	As per requirement	5 set

15	Documentation Tools (Software for creating and maintaining documentation, including system architecture, wiring diagrams)	As per requirement	5 set
16	Toolkits (General hand tools, screwdrivers, pliers, and other tools)	As per requirement	5 set
17	Power Supplies	As per requirement	1
18	Test Rigs and Simulators	As per requirement	1
19	Remote Monitoring and Maintenance Tools		5 set

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Whiteboard
2. Projector
3. Computer/Laptop
4. Chairs
5. Tables
6. Whiteboard marker

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	ArcelorMittal Nippon Steel India Ltd.	Mr. Prakash Hegde	DGM	27 th km, Surat-Hazira Rd., Hazira, Surat 394270, Gujarat	9909901396	Prakash.hegde@amns.in	
2	IPS Contractors & Labour Suppliers	Mr. Tosif Shaikh	IPS Contractors	Pithampur Disst. Dhar (MP) 454775	9907590590	hr.ipscontractors@gmail.com	
3	Tata Steel Mining Ltd.	Mr. Ajay Kumar Singh	AGM-HR	Bhubaneswar, Odisha – 751015	9234511004	a.singh@tatasteelmining.com	
4	Tata Steel Ltd	Mr. Padmapal	Chief of Blast Furnaces	Mumbai	9234567561	Padma.pal@tatasteel.com	
5	Rourkela Steel Plant	Mr. H. Pati	GM	Rourkela - 769011	8895500593		
6	Super Pannel Pvt Ltd.	Mr. Ankit Kumar	Director	Mohan Nagar, Ghaziabad	9899991388	Director.superpanel@hotmail.com	

7	Tenacious Services Pvt Ltd.	Mr. Pankaj Kumar	VP	Najafgarh, New Delhi-110043	7763856257	Pankaj.kumar@tenacious.co.in	
8	Shri Om Automotive Products	Mr. Abhinav Jain	Managing Partner	Hissar Road, Rohtak-124001, Haryana	9729711099		
9	Sun Bright Manpower Solution Pvt Ltd.	Mr. Arun Kumar	Supervisor	Kolar Taluk Dist. 563133	7338463588	bangalore@sunbrightgroup.com	
10	Manpower Group Service India Pvt Ltd.	Mr. Durgesh Bhagariya	Head Branch Operation	Jasola, New Delhi-110025	9824054165	Durgesh.b@manpower.co.in	
11	Gauri Shankar Enterprises	Mr. Puneet Goyal	Prop.	Jalandhar, Punjab	9888288898		
12	SK Sales Company	Mr. Mohit Sood	Director	Jalandhar, Punjab	9872307801	sksalescompany@gmail.com	
13	S.S. Industries	Mr. Aikagra Aggarwal	Prop.	Jalandhar, Punjab	8054961300	aikagraaggarwal@yahoo.com	
14	Noble Products	Mr. R. P. Singh	Prop.	Jalandhar, Punjab	8532000039	39noblepro@gmail.com	
15	Surya Consultancy & Solutions	Mr. V. Ravi Kumar	Owner	Govindappa Building, Narasapura, Kolar – 563133	7338463588	Suryaconsultancy.solution@gmail.com	
16	Texmo Industries	Mr. C Manimaran	Asst. Mgr	Coimbatore - 641029	6610300	trm@texmo.net	
17	N. V. Enterprises	Mr. Amresh Kumar Tyagi	Owner	Thiruppathi, Valley, Hosur (TN) 635109	9944799610	Nthyagi2010@gmail.com	
18	TDS Placements & Services Pvt Ltd.	Mr. Joy Mitra	Manager	Chandigarh	8010154000	operation@tdsjob.com	
19	Race Cable Pvt Ltd.	Mr. Daleep Pandey	HR Head	Bhiwari, Rajasthan	9958477470	racecable@gmail.com	
20	Himanshu Projects Pvt. Ltd.	Mr. Rinku Kumar	Project Head	Ghaziabad, U.P.	9027740959	Hppt2007@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
2023-24	500	350	200	140	50	35
2024-25	1000	700	400	280	100	70
2025-26	1500	1050	600	420	150	105

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

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” 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	• Books/ e-books • Presentations • Reference Material • Audio / Video Modules	40:60
2	☒ Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	• Self-Learning Videos • Broadcasts • Mobile Learning • Curated Digital content	40:60
3	☒ Showing Practical Demonstrations to the learners	• Video Content • E-Resource library • AR/ VR/ XR	40:60
4	☒ Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	• Training tools (tools list attached) • Video Play • Presentations	40:60
5	☒ Tutorials/ Assignments/ Drill/ Practice	• Online Question Bank • Mobile Quick test app • MCQ based tests	40:60
6	☒ Proctored Monitoring/ Assessment/ Evaluation/ Examinations	• Assessment engine for Essays • Up-loadable file examinations • Mock test sessions	40:60
7	☒ On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	• Online tests • Offline assessments	40:60

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
ISC/N0946: Manage and implement health and safety practices at the work place	<i>Maintain safe and secure working environment</i>	12	21	-	8
	PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace	2	3	-	1
	PC2. implement safe working practices while dealing with hazards to ensure safety of self and others	2	2	-	1
	PC3. ensure that team is following appropriate safety practices while working in and around trenches, elevated places and confined areas	1	2	-	-
	PC4. conduct regular checks of the machines with support of the maintenance team to identify potential hazards	2	4	-	1
	PC5. organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices	1	2	-	1
	PC6. fill daily check sheet to report improvements done and risks identified	1	2	-	1
	PC7. ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others	1	2	-	1
	report any identified breaches in health, safety and security policies and procedures to the designated person	1	2	-	1
	PC8. ensure that team is following appropriate emergency procedures such as raising alarm, safe evacuation etc.	1	2	-	1
	PC9. <i>Maintain health and hygiene</i>	6	9	-	4
	PC10. ensure team is aware about hygiene and sanitation regulations and following them on the shop floor	2	3	-	1
	PC11. ensure workplace, equipment, restrooms etc. are cleaned and sanitized regularly	1	2	-	1
	PC12. ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace	1	2	-	1
	report advanced hygiene and sanitation issues to appropriate authority	1	1	-	1
	PC13. report regarding the contagious illness of self or people in close contact	1	1	-	-

	PC14. <i>Manage housekeeping at workplace</i>	6	10	-	4
	PC15. implement appropriate housekeeping methods and practices at workplace	2	3	-	1
	PC16. ensure good housekeeping in order to prevent hazards and accidents	1	2	-	1
	monitor that that team is storing the material, tools and equipment in the correct location and in good condition after work completion	1	2	-	1
	PC17. ensure recyclable, non-recyclable and hazardous wastes are segregated as per SOP	1	2	-	1
	PC18. ensure proper mechanism is followed while collecting and disposing of non-recyclable, recyclable and reusable waste	1	1	-	-
	PC19. <i>Implement material and energy conservation practices</i>	6	10	-	4
	PC20. identify processes where material and energy/electricity utilization can be optimized	2	3	-	1
	PC21. ensure malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment are resolved effectively	1	2	-	1
	PC22. prepare and analyze material and energy audit reports to decipher excessive consumption of material and water	2	3	-	1
	PC23. identify possibilities of using renewable energy and environment friendly fuels	1	2	-	1
	Total Marks	30	50	-	20
ISC/N2002: Develop HMI/SCADA application	<i>Identify the requirements for the HMI/SCADA application</i>	9	10	-	5
	PC1. identify the end-users are (operators, engineers, managers, etc.) and their specific needs	1	1	-	-
	PC2. define what the system needs to monitor, control, and report on (e.g., process variables, alarms, control actions)	1	2	-	1
	PC3. consider performance, scalability, security, user interface design, and integration with other systems	2	2	-	1
	PC4. select appropriate SCADA software based on the requirements, scalability, and compatibility with existing hardware (e.g., Wonderware, Ignition, WinCC, FactoryTalk)	2	2	-	1
	PC5. select hardware for operator interfaces such as touch panels, workstations, or mobile devices.	1	1	-	1
	PC6. decide on protocols and devices for communication between the SCADA server, controllers, sensors, and field devices	2	2	-	1
	<i>Develop an HMI/SCADA application</i>	13	25	-	11
	PC7. start the programming software to write the algorithm/ program	1	1	-	-

PC8.	design the high-level system architecture, considering factors like the number of devices, data flow, server-client relationships, and communication protocols (e.g., Modbus, OPC, MQTT)	1	2	-	1
PC9.	decide on the number of HMI workstations, server setups, and SCADA network layout (centralized or distributed)	1	2	-	1
PC10.	identify the process variables, alarms, and control actions that need to be tracked and controlled	1	3	-	1
PC11.	set up SCADA servers, create databases for storing real-time and historical data, and configure alarms and events	1	3	-	1
PC12.	configure data points (tags) to represent sensors, actuators, and control elements	1	2	-	1
PC13.	design and develop HMI screens that visualize the process, display real-time data, and enable user interaction	1	2	-	1
PC14.	integrate control logic, scripts, and sequences for controlling machines and processes (e.g., starting/stopping pumps, opening/closing valves)	1	2	-	1
PC15.	define the conditions for triggering alarms, as well as the actions that should occur in response (e.g., notifications, logging)	1	2	-	1
PC16.	establish communication between the SCADA system and programmable logic controllers (PLCs) or remote terminal units (RTUs)	1	2	-	1
PC17.	ensure that data is transferred in real time from sensors and devices to the SCADA system	1	2	-	-
PC18.	set up data acquisition systems (DAS) to gather information from field devices (e.g., pressure, temperature, flow rates)	1	2	-	1
PC19.	implement system redundancy, including backup servers and communication paths, to ensure high availability and reliability	1	2	-	1
Test and verify HMI/SCADA application		8	15	-	4
PC20.	test and debug the program by connecting directly to databases, hardware, and instruments with different inputs to ensure its correctness and efficiency	1	2	-	1
PC21.	test individual components (HMI screens, control actions, communication protocols) to ensure they work correctly	1	2	-	1
PC22.	conduct end-to-end testing to verify that the entire SCADA system is operating as intended, including communication between devices, control actions, and data handling	1	2	-	1
PC23.	validate the system usability, functionality, and reporting to ensure it meets their needs and expectations	1	2	-	1
PC24.	verify test results and other diagnostic findings	1	2	-	-
PC25.	edit program, if necessary to adjust operation, as required	1	1	-	-
PC26.	use the appropriate storage medium for saving the proven program	-	1	-	-
PC27.	produce operation sheets to specification in accordance with SOPs which includes appropriate, where required	1	2	-	-
PC28.	complete workplace documentation according to established procedures	1	1	-	-
Total Marks		30	50	-	20

ISC/N2001: Perform development of PLC program	<i>Identify the requirements for the PLC application</i>	10	12	-	6
	PC1. identify and analyse the control system specifications and PLC application requirements from documentation, work request or discussion with relevant personnel	1	2	-	1
	PC2. identify and select appropriate development tools, programming software, development platform, PLC modules etc. as per the system requirements	2	2	-	1
	PC3. identify and select PLC system and components like sensors, limit switches, push buttons etc. as per the requirement of control system	2	2	-	1
	PC4. collect information about pre-requisites for software installation on PC/laptops for programming, communication protocol to be used for communication between programming software and PLC, communication program blocks used especially for communication between different components in the panel, normally open (NO) and normally closed (NC) contacts in field, input and output devices and terminals etc. to be used in the control system	2	2	-	1
	PC5. identify the need of timer and counter logics blocks, special blocks like PID, high speed counters etc. in the control system	1	2	-	1
	PC6. collect information about bit instructions, mathematical instructions, conversion instructions and compare instructions to be used in the program	1	1	-	1
	PC7. decide on the core and auxiliary support process as per specifications & drawings	1	1	-	-
	<i>Develop a PLC program</i>	10	20	-	8
	PC8. start the programming software to write the algorithm/ program	1	1	-	-
	PC9. analyse the data and variables / predictors need to consider during programming	1	2	-	1
	PC10. use toolboxes in programming software provide a range of functions such as defining input and output terminals, making wiring connections, defining NO/NC contacts, etc. as per the algorithm requirement	1	2	-	1
	PC11. develop PLC programs adhering to programming rules	1	3	-	1
	PC12. apply common elements such as character sets, identifiers, data types, variables and functions available in the software used for programming	1	3	-	1
	PC13. define input and output terminals in the program as per the process system requirement	1	2	-	1
	PC14. use required PLC modules, connectors, and other equipment according to manufacturer's specifications and PLC application requirements in the program	1	2	-	1
	PC15. program PLC locally or via cloud according to manufacturer's specifications and PLC application requirements	1	2	-	1
	PC16. check the sequence of the program as per the process sheet	1	1	-	-
	PC17. verify the program by using Test Manager to run tests and view results	1	2	-	1
	<i>Test and verify PLC program</i>	10	18	-	6

	PC18. test and debug the program by connecting directly to databases, hardware, and instruments with different inputs to ensure its correctness and efficiency	1	2	-	1
	PC19. test the function and operations of the PLC program	1	2	-	1
	PC20. verify test results and other diagnostic findings	1	2	-	1
	PC21. resolve faults and other non-conformances including seeking expert assistance when needed	1	2	-	1
	PC22. edit program, if necessary to adjust operation, as required	1	1	-	-
	PC23. analyse the algorithm's performance to identify any bottlenecks or areas for optimization	1	2	-	1
	PC24. follow the approved procedures to resolve problems encountered with the programming, testing and editing activities	-	1	-	-
	PC25. use the appropriate storage medium for saving the proven program	1	1	-	-
	PC26. produce operation sheets to specification in accordance with SOPs which includes appropriate, where required	1	2	-	1
	PC27. document PLC program and function test according to workplace procedures	1	2	-	-
	PC28. complete workplace documentation according to established procedures	1	1	-	-
	Total Marks	30	50	-	20
	ISC/N2003: Perform installation and commissioning of PLC system	5	7	-	3
	<i>Prepare for installation activities</i>	5	7	-	3
	PC1. obtain and interpret the design, wiring/mechanical drawings, job instructions and work manuals related to installation of PLC control system and clarify doubts if any to the supervisor/relevant personnel	1	2	-	1
	PC2. plan for installation and commissioning activities of the PLC panels	1	2	-	1
	PC3. ensure availability of tools and tackles, electrical and mechanical equipment, PLC panels etc. required during installation and commissioning activities at the site	3	3	-	1
	<i>Installation and integration of PLC control systems</i>	19	32	-	13
	PC4. mount and place the electrical and mechanical components of process equipment safely as per the design and wiring/mechanical drawings	2	3	-	1
	PC5. route electrical wires and make wiring connections with input and output terminals etc. as per the wiring diagram and SOP	2	3	-	1
	PC6. ensure that each sensor, switch, and button is connected to particular input and each actuator to the output and the address and cables should not be mixed	1	2	-	-
	PC7. verify that incoming power supply matches the PLC's voltage settings	1	2	-	1
	PC8. verify and / or perform settings of various components/sub-systems of the control panels supplied as per design documents	2	3	-	1
	PC9. ensure that fuses, switches and other protective devices are set properly	1	2	-	1
	PC10. start the PLC system, look for any warnings/errors in it and rectify the same as per organizational guidelines	3	3	-	1
	PC11. activate the sensors, limit switches, push buttons etc. to verify them on input module	1	2	-	1

	PC12. activate the PLC outputs to check working of field outputs like actuators, contactors, relays etc.	1	2	-	1
	PC13. load the program from the PC to CPU and test the software to ensure proper functionality	2	2	-	1
	PC14. check the PLC program by actuating sensors, switches, push buttons etc. and observe the functioning of outputs	1	2	-	1
	PC15. run software checking program or simulation tool to check the installed program for incorrect device address, preset values, I/O points operations, counter and timer settings for any error	1	2	-	1
	PC16. optimize the software by doing changes or correcting the errors in the program as per the requirement after simulation process	1	2	-	1
	PC17. validate safety requirements according to safety analysis and cause-effect diagrams	1	2	-	1
	Commissioning of PLC control systems	6	11	-	4
	PC18. perform commissioning procedures according to plan	1	2	-	1
	PC19. conduct the trials of process equipment to ensure proper functionality	1	2	-	1
	PC20. test operation of process system after commissioning and rectify or report non-conformances according to workplace procedures	1	2	-	1
	PC21. advise appropriate personnel when PLC based industrial control system is completed and equipment and machinery can be released from isolation	1	1	-	-
	PC22. handover the system to process operator/ team after testing by following organizational guidelines and procedures	1	2	-	1
	PC23. prepare documents and records related installation, commissioning and trials as a reference for future development	1	2	-	-
	Total Marks	30	50	-	20
ISC/N2004s: Perform repairing and maintenance of PLC systems	Maintenance of PLC system	11	22	-	9
	PC1. enquire with the user/operator about any problems/unusual conditions noticed on the PLC systems	1	2	-	1
	PC2. follow safety practices during maintenance activities as per organisational SOP	-	1	-	-
	PC3. perform basic health check-up of PLC systems as specified in the maintenance checklist	1	2	-	1
	PC4. check the equipment for any operational deviations, geometric inaccuracies or internal conditions to test its working status and expected conditions	2	3	-	1
	PC5. check the PLC systems for any wear and tear, damage, improper functioning etc.	1	2	-	1
	PC6. dismantle the equipment and replace/change the spare parts and consumables as per the schedule	1	2	-	1
	PC7. conduct breakdown maintenance and then inspect the PLC system for wire breakages, short-circuit, overheating, unusual noise, changes in noise, temperatures, pressures, under-rated performance etc. as reported in the complaint	2	4	-	2

	PC8. analyse the readings to identify any deviations and correct them if not within the desired levels	1	2	-	1
	PC9. repair or replace damaged components as per the requirement	1	3	-	1
	PC10. use recommended consumables, tools and equipment for service and repair of equipment as per Standard Operating Procedures (SOP)	1	1	-	-
	Troubleshooting and repairing of faults in PLC systems	19	28	-	11
	PC11. identify diagnostic procedures from control system documentation, plant and process documentation, or discussion with relevant personnel	2	3	-	1
	PC12. consult with appropriate personnel to ensure planned work is coordinated effectively with others and system downtime is minimised	1	1	-	1
	PC13. ensure appropriate materials, components, tools and equipment are available required for the troubleshooting and repairing of faults in control system	1	1	-	1
	PC14. determine the need to observe, test or measure the system live and arrange access if required	1	2	-	-
	PC15. perform diagnostic processes and techniques efficiently to minimise disruption, wastage and downtime	2	3	-	1
	PC16. isolate control system circuits where required according to manufacturer's instructions and standard operating procedures (SOPs)	1	1	-	1
	PC17. check for faults in components in a systematic manner with reference to the required operating functions and parameters	1	2	-	1
	PC18. provide solutions to control system faults and non-conformances	1	2	-	-
	PC19. assess when the problem is beyond the competence and report the problem to suitably qualified/designated and competent personnel	1	1	-	-
	PC20. apply safety and risk control measures and procedures to completing the diagnostic and repair activities	1	2	-	1
	PC21. repair or replace identified faulty components or materials	1	2	-	1
	PC22. identify programming related faults and arrange for reprogramming according to SOPs	1	2	-	1
	PC23. return control system to normal operation	1	1	-	-
	PC24. refer faults requiring additional expert assistance to manufacturer or other expert	1	1	-	1
	PC25. monitor system after diagnostic and repair and confirm operation against specified parameters	1	2	-	1
	PC26. prepare or maintain required documentation and reports in line with organisational policies and procedures	1	1	-	-
	PC27. dispose off waste materials such as failed parts/aggregates, as per organisation's policies	1	1	-	-
	Total Marks	30	50	-	20
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				

<i>Constitutional values – Citizenship</i>	1	1	-	-
PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC4. follow environmentally sustainable practices				
<i>Becoming a Professional in the 21st Century</i>	2	4	-	-
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. practice the 21st Century Skills such as Self- Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life				
<i>Basic English Skills</i>	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				
<i>Career Development & Goal Setting</i>	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.				
<i>Communication Skills</i>	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	-	-	-	-
<i>Diversity & Inclusion</i>	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	-	-	-	-
<i>Financial and Legal Literacy</i>	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				
<i>Essential Digital Skills</i>	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				
<i>Entrepreneurship</i>	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				
<i>Customer Service</i>	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				
<i>Getting ready for apprenticeship & Jobs</i>	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 requirement				
Total Marks	20	30	-	-
Grand Total	170	280		100

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

2. Testing Environment:

- Confirm that the centre is available at the same address as mentioned on SDMS or SIP
- Check the duration of the training.
- Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
- EAF 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
- Assessor must be ToA certified & trainer must be ToT Certified
- Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- Centre photographs with signboards and scheme specific branding
- Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
- Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:

- Surprise visit to the assessment location
- Random audit of the batch
- Random audit of any candidate

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored
- Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
- Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

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