

QUALIFICATION FILE

Solar Panel Installation Technician

- ☒ Short Term Training (STT) ☐ Long Term Training (LTT) ☐ Apprenticeship
☐ Upskilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA
☒ General ☐ Multi-skill (MS) ☐ Cross Sectoral (CS) ☐ Future Skills ☐ OEM

NCrF/NSQF Level: 4

Submitted By:

Electronics Sector Skills Council of India (ESSCI)

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Section 1: Basic Details

1.	Qualification Name	Solar Panel Installation Technician													
2.	Sector/s	Electronics													
3.	Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of existing/previous qualification: (change to previous, once approved)- 2022/EHW/ESSC/06654 & V3.0	Qualification Name of existing/previous version: Solar Panel Installation Technician												
4.	a. OEM Name b. Qualification Name (Wherever applicable)	NA													
5.	National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval)	QG-04-EH-04471-2025-V2-ESSCI	6. NCrF/NSQF Level: 4												
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	Solar Panel Installation Technician in this job checks the installation site, understands the layout requirement as per design, assesses precautionary measures to be taken, installs the solar panel as per customers requirement and ensures effective functioning of the system post installation.													
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 or equivalent</td> <td>NA</td> </tr> <tr> <td>2</td> <td>10th grade or equivalent</td> <td>3 years relevant experience.</td> </tr> <tr> <td>3</td> <td>Certificate-NSQF (Level-3 in relevant domain)</td> <td>3 Years of relevant Experience</td> </tr> </tbody> </table> # Relevant Experience in Solar & LED b. Age: NA		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	12th grade or equivalent	NA	2	10th grade or equivalent	3 years relevant experience.	3	Certificate-NSQF (Level-3 in relevant domain)	3 Years of relevant Experience
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)													
1	12th grade or equivalent	NA													
2	10th grade or equivalent	3 years relevant experience.													
3	Certificate-NSQF (Level-3 in relevant domain)	3 Years of relevant Experience													
10.	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	16	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"> <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>00:00</td> <td>180:00</td> <td>150:00</td> <td>00:00</td> <td rowspan="2">480:00</td> </tr> <tr> <td>Online</td> <td>150:00</td> <td>00:00</td> <td>00:00</td> <td>00:00</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)	00:00	180:00	150:00	00:00	480:00	Online	150:00	00:00	00:00	00:00
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Classroom (offline)	00:00	180:00	150:00	00:00	480:00																		
Online	150:00	00:00	00:00	00:00																			
14.	Aligned to NCO/ISCO Code/s (<i>if no code is available mention the same</i>)	NCO-2015/7421.1401																					
15.	Progression path after attaining the qualification (<i>Please show Professional and Academic progression</i>)	Sr. Technician Installation (Solar Panel)																					
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 (Employability Skills (30 hours))																					
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: Saleem Ahmed Email: ceo@essc-india.org Contact No.: 011 – 8447738501 Website: https://www.essc-india.org/																					
23.	Final Approval Date by NSQC: 07.10.2025	24. Validity Duration: 3 Years			25. Next Review Date: 07.10.2028																		

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	Check site conditions, collect tools and raw materials	ELE/N5901 & V3.0	Core	4	7	60	90	60	0	210	35	65	0	0	100	40
2	Install the Solar Panel	ELE/N5902 & V4.0	Core	4	8	60	90	90	0	240	35	65	0	0	100	40
3	Employability Skills (30 hours)	DGT/VSQ/N0101 & V.1	Non-core	4	1	30	0	0	0	30	20	30	0	0	50	20
Duration (in Hours) / Total Marks					16	150	180	150	0	480	90	160	0	0	250	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/ITI (Mechanical/Electronics/Electrical) with 1 years industrial and 1 year training experience in the field of Solar Panel Installation. Or Certified in relevant CITS Trade
2.	Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Diploma/ITI (Mechanical/Electronics/Electrical) with 2 years industrial and 1 year training experience in the field of Solar Panel Installation. Or Certified in relevant CITS Trade
3.	Tools and Equipment Required for Training	☒ Yes ☐ No (If "Yes", details to be provided in Annexure)
4.	In Case of Revised Qualification, Details of Any Upskilling Required for Trainer	NA

Section 4: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma/ITI (Mechanical/Electronics/Electrical) with 2 years industrial and 1 year training experience in the field of Solar Panel Installation. Or Certified in relevant CITS Trade
2.	Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma/ITI (Mechanical/Electronics/Electrical) with 3 years industrial and 2 year training experience in the field of Solar Panel Installation. Or Certified in relevant CITS Trade
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma/ITI (Mechanical/Electronics/Electrical) with 4years industrial and 3 year training experience in the field of Solar Panel Installation. Or Certified in relevant CITS Trade.
4.	Assessment Mode (Specify the assessment mode)	Blended
5.	Tools and Equipment Required for Assessment	☒ Same as for training ☐ Yes ☐ No (details to be provided in Annexure-if it is different for Assessment)

Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	Latest Skill Gap Study (not older than 2 years) (Yes/No): Yes
2.	Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): Yes
3.	Government /Industry initiatives/ requirement (Yes/No): Yes
4.	Number of Industry validation provided: 30
5.	Estimated nos. of persons to be trained and employed: 10000
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)	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 (Mandatory, in case selected Mode of delivery is "Blended Learning")	Filled
6.	Annexure: Multiple Entry-Exit Details (Mandatory, in case qualification has multiple Entry-Exit)	Filled
7.	Annexure: Acronym and Glossary (Optional)	Attached
8.	Supporting Document: Model Curriculum (Mandatory – Public view)	Attached
9.	Supporting Document: Career Progression (Mandatory - Public view)	Attached
10.	Supporting Document: Occupational Map (Mandatory)	Attached
11.	Supporting Document: Assessment SOP (Mandatory)	
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	Demands a wide range of specialized technical skill, clarity of knowledge and practice in broad range of activity involving standard and non-standard practices.	Based on the problem cited by customer he is free to choose the remedy which works well for the problem and thus, he usually works in situation of clear choice.	4

	- Requires good understanding Equipment installation and problems, Site Topology and equipment location, knowledge of unpacking and positioning the equipment in professional way, and methodically routing the interconnecting cables, power cables and wires. - These activities are routine and Predictable in nature and are independent of the customer location.	Hence Level 4	
Professional and Technical Skills/ Expertise/ Professional Knowledge	Factual and theoretical knowledge in broad contexts within a field of work or study. - Requires advanced understanding of the equipment, functionality, and knowledge of site problems. This requires having knowledge and understanding of the concepts of Cable Technology/related instruments/Signals form. - He requires knowledge of Solar lighting, directions, shadow regions.	Factual knowledge from experience in field Hence Level 4	4
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study. Work involves installation of Solar Panel at customer site. Good understanding of Customer expectation, advise customer on Operation of equipment.	Requires technical expertise, necessary skill, correct tools and replacement parts to achieve productivity and quality. QP requires utilizing the involved practical skills Hence Level 4	4

	Requires good knowledge of the product, its specifications and suitability to customer requirements.		
Broad Learning Outcomes/Core Skill	Needs proficiency in: - Requires knowledge of language, good communication skills and documentation skill for collecting information, filling up the forms, issuing Bills, collecting payments and getting endorsement from customer. - Interacting with superior briefing them on status of work-completion and pending targets, new customer requirements and alternate strategies. - Maintain good peer group relation and capability of learning from their technical and behavioral experiences.	These requires basic, social, political and environmental skill Hence Level 4	4
Responsibility	Responsibility of completing the work assigned and reporting the same as per standards. In his routine activities of Normal Installation and Repair he is not under any kind of supervision	The individual on the job is responsible for own work and fully responsible for other's work and learning Hence Level 4	4

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size: 30

S. No.	Tool / Equipment Name	Specifications	Quantity for specified Batch size
1	Allen Key Set	Nos	6
2	Batteries	Nos	3
3	GPS App /online site survey app	Nos	100
4	Charge Controller	Nos	6

5	Connecting Wires	Nos	50
6	Digital Multimeter	Nos	6
7	Drill Machine	Nos	3
8	Lead Solder	Nos	6
9	Load (AC/DC)	Nos	6
10	MC4 Connectors	Nos	12
11	Mechanical Fixtures Required For Panel Installation	Nos	6
12	PCUs	Nos	6
13	Plier	Nos	6
14	Regulated Power Supply	Nos	3
15	Safety Gloves	Pair	6
16	Safety Helmet	Nos	6
17	Safety Shoes	Pair	6
18	Screw Driver Set	Nos	6
19	Solar Chart	Nos	30
20	Solar Conversion Kits	Nos	3
21	Solar Inverter	Nos	3
22	Solar Panels	Nos	4
23	Soldering Flux	Nos	6
24	Soldering Iron	Nos	6
25	Wire Stripper	Nos	6
26	Steel Mounting bolt, Module attachment and grounding clip, Module spacer, Anodized aluminum mounting foot, Integrated butyl tape sealant	Nos	As required
27	Digital Inclinator / Angle Finder	Nos	6
28	Caliper (Digital or Vernier)	Nos	6

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	Nagdeo Education Welfare Society	Vijay Nagdeo	General Manager	Ward No. 11 Junnardeo Dist. Chhindwara M.P. 480551	9425461093	Vijaynagdeo02@gmail.com	
2	Access Edutech Pvt. Ltd.	Sanjay Kumar Mishra	Director	96, Vrindavan Nagar Ayodhya Bypass Road Bhopal	7000650224	sanjaymishra@accessedutech.com	
3	SHIV SHAKTI TECKNIKI EVAM SAMANAYA SHIKSHAN SANSTHAN	Jitendra Kumar Garg	President	B 32 MAHESH NAGAR JAIPUR RAJASTHAN-302015	9782912782	jitendra.garg303@gmail.com	
4	YADUVANSHI PRIVATE ITI	YADVENDRA	PRINCIPAL	TC229199 - YADUVANSHI PVT ITI, HASAMPUR The-NEEMKATHANA DIST-SIKAR RAJASTHAN PIN CODE NO - 332718	8432882688	yaduvanshicollege2008@gmail.com	
5	Ephicacy Lifescience Analytics	Rahul Kumar Kaushik	Senior Software Engineer	2nd Main Rd, Sarvobhogam Nagar, Arekere, Bengaluru, Karnataka 560076	8859885973	Rahul.Kaushik@ephicacy.com	
6	Nagravision India Pvt. Ltd.	Avinash Yadav	Manager- System Administrator	RMZ Centennial, Tower C unit 301 and 302, Mahadevapura Post ITPL Road, Bangalore	9808326626	avinash.yadav@nagra.com	
7	HPL Electric & Power Ltd	S K Singh	National Head(Solar)	Sector 10 Noida UP 201302	9818092882		
8	IAS Energy Solution	Atin Rathore		G 97 1 st Floor, Sant Nagar Extention Near Sahib Pura New Delhi 18	7011791014		

9	Surana Solar Ltd			Hyderabad			
10	Solar Promotion Society	V Gupta	President	Villa No. 117, Block IV Eros Garden Faridabad 121009	9717700198	Vgupta11@gmail.com	
11	Nexgen Exhibitions Pvt. Ltd.	Saurabh Purwar	Director	1201/1206 Pragati Tower, 26 Rajendra Place, New Delhi-110008, India	9457306691	fbvidgo@gmail.com	
12	Siemens Limited	Manoj Belgaonkar	Head – Regulations, Standards and QM	R&D Centre, Thane Belapur Road, Airoli, Navi Mumbai 400708	9820682825	manoj.belgaonkar@siemens.com	
13	Tata Consultancy Services	Sheepara Kaushik	Consultant – Product Development	Kensington B Wing, Hiranandani SEZ, Powai, Mumbai 400076	8433595090	sheepara.sharma@tcs.com	
14	Conduent- https://www.conduent.com	Prince Jain	Senior Business Analyst	7 to 9th Floor & 6 to 9th Floor, Building No.5 & 6, Plot No 20&21, Candor Tech Space, IT/ITES SEZ., Noida, Uttar Pradesh 201304	8439385780	prince.jain@conduent.com	
15	Artificial Intelligence Technologies	Rohit Kumar Sharma	Manager – Product Development	A-21, sector 4, Block A, Kailash Colony, Greater Kailash, New Delhi	9927564461	rohit.sharma@aituniversitysal.com	
16	Shri Prasad Sharma Shikshan Sansthan Myana	Suresh		Gautam Budha Nagar UP	8433476571		
17	Solar Edge Technologies Ltd	Shivendra Singh Yadav	Manager Sales(North)	Krishna Nagar Delhi 110051	9718302626	Shivendra.s@solaredge.com	
18	Evergreen Education Trust	Faizanbazaz	Director	217, Pehari Colony Jammu 180005	7006341193	eetturst@gmail.com	

19	IIAE Educational Society	Barinder Singh	President		9829745313	ivyindiaprojects@gmail.com	
20	Bergen Associates Pvt Ltd.	Soubam Sunil	Manager	305-306, Magnum House-I, Commercial Complex, Karampura, New Delhi – 110015	9311780832	s.soubam@bergengroupindia.com	
21	Sankalp Education and development society	Jafruddin Khan	SPOC		8104049522		
22	Ramyash Pvt ITI	Ramyash	Principel	Jamalpur	9454738298	Yashvantiyadav964@gmail.com	
23	Sundak Solar Solution Pvt Ltd	Prince Pathak	Manager	Gautam Budh Nagar Noida 201301	9911614488		
24	Sungrow Pvt. Ltd.	Shivang Gupta	Sr. Executive	Sector 15 Gurugram 122001	9999883279		
25	Shri Solasar Balaji Shikshan	Nand Kishor Gurjar	SPOC	Rajasthan	9358734466	shribalajiitisujangarh@gmail.com	
26	Sri Venkateswara College of Engineering	Dr C Chandrasekhar	Head R &D & Professor in ECE	Karakmbadi Road,Tirupati 517507	9177217190	dr.chandrasekhar.c@svcolleges.edu.in	
27	Sri Rajaram Shikshan Sansthan	Rajendra Parsad	Principle		8808696968	rajendraitijnp@gmail.com	
28	Shree Hari Shikshan Santhan Aaspura	Mukesh Kumar	SPOC	Rajasthan 341508	7877239952	Harikct2024@gmail.com	
29	B M Upadhyay Shiksha Samiti	K K Upadhyay	SPOC	Agra	9149158684	Kk7500081234@gmail.com	
30	Rastriya Khushali Sansthan	Ramkaran Sinsinwar	President	VOP Tajsar Fatehpur Rajasthan	6350658040	Rkstajsar1998@gmail.com	

Annexure: Training Details

Training and Employment Projections:

Year	Total Candidates	Women	People with Disability
	Estimated Training # Total	Estimated Training # Women	Estimated Training # PwD
2025-26	2500	NA	NA
2026-27	2500	NA	NA
2027-28	5000	NA	NA

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
3.0	2022-23	23347	18598	16386	NA	NA	NA	NA	NA	NA	NA	NA	NA
3.0	2023-24	10137	7099	6476	NA	NA	NA	NA	NA	NA	NA	NA	NA
3.0	2024-25	26885	21166	19954	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. PMKVY
- 2.

Content availability for previous versions of qualifications:

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

Languages in which Content is available:

1. English

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	30:70
2	☒ Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	• Self-Learning Videos • Broadcasts • Mobile Learning • Curated Digital content	30:70
3	☒ Showing Practical Demonstrations to the learners	• Video Content • E-Resource library • AR/ VR/ XR	30:70
4	☒ Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	• Training tools (tools list attached) • Video Play • Presentations	30:70
5	☒ Tutorials/ Assignments/ Drill/ Practice	• Online Question Bank • Mobile Quick test app • MCQ based tests	30:70
6	☒ Proctored Monitoring/ Assessment/ Evaluation/ Examinations	• Assessment engine for Essays • Up-loadable file examinations • Mock test sessions	30:70
7	☒ On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	• Online tests • Offline assessments	30:70

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
ELE/N5901: Check site conditions, collect tools and raw materials	<i>Introduction of solar technology and Identify plan the work target</i>	4	6	-	-
	PC1. Introduce solar energy as a renewable source and explain how PV cells convert sunlight into electricity. Outline key parts like panels, inverter, battery, and how they function together in a solar setup.	2	3	-	-
	PC2. Interact with the supervisor to understand the installation targets, individual work requirements, and areas of operation; conduct site surveys using GPS to identify installation locations, plan daily activities, and finalize the work plan for each installation.	2	3	-	-
	<i>Assessing site conditions</i>	5	12	-	-
	PC3. assess the site for identify pre-requisites for solar panel installation	1	3	-	-
	PC4. select the type of smart mounting to be made such as roof top, open fields, small spaces and mounting accessories required for installation as per the site condition	1	3	-	-
	PC5. select the place of installation where maximum period of sunlight is captured in the area	1	2	-	-
	PC6. ensure that land is levelled for flat surface mounting and construction is strong to hold solar panel for 20-25 years, especially, on roof top	1	1	-	-
	PC7. identify any civil construction requirements for installing the panels and inform the customer for same	1	3	-	-

<i>Identify the installation requirement</i>	10	14	-	-
PC8. interact with customer and understand the purpose of installation and suggest alternatives	1	3	-	-
PC9. obtain the location and mounting preference of customer	1	2	-	-
PC10. match the voltage and power output of the type of installation designed and losses with customer requirement	3	3	-	-
PC11. inform customer about the approximate time required for installation and any requirements during installation	2	3	-	-
PC12. get concurrence from the customer on the package of materials to be procured for installation based on agreed design	3	3	-	-
<i>Collecting recommended material for installation</i>	9	14	-	-
PC13. arrange and collect the material such as solar panels as per customers requirement, mounting stands as per design, tools and consumables required for mounting the solar panels	3	5	-	-
PC14. ensure that the quantity of modules / panels match the voltage requirement of the system	2	2	-	-
PC15. ensure that only company recommended quality materials are used unless specified by customer	2	3	-	-

	PC16. ensure all the materials procured are QC passed, module is not damaged and the outer glass is not broken	2	4	-	-
	<i>Ensure proper handling and storage of material</i>	7	19	-	-
	PC17. identify the material handling requirement and follow the standard operating procedure while moving the material	2	5	-	-
	PC18. follow the standard module handling procedure such as two people should lift a module, module should not be carried on head, etc.	2	5	-	-
	PC19. cover the glass module with an opaque material in storage to ensure that there is no electricity generation before installation	2	5	-	-
	PC20. ensure that modules are stored in a way that they will not get not damaged by falling or by any external disturbance	1	4	-	-
	NOS TOTAL	35	65	-	-
ELE/N5902: Install the Solar Panel	<i>Understanding installation and material usage procedure</i>	4	11	-	-
	PC1. understand the customer requirement on installation	1	1	-	-
	PC2. ensure that all appropriate materials are available during installation time	1	1	-	-
	PC3. ensure that the installation meets the local building rules and regulations	-	2	-	-

PC4. ensure to disconnect PV module from any electric sources such as batteries, inverters, etc., before working on the module	1	2	-	-
PC5. check that the module is defect free before installing	1	2	-	-
PC6. ensure to take specified measures such as fire resistance, corrosion resistance for the module during installation	-	3	-	-
<i>Assessing mounting using smart accessories</i>	1	2	-	-
PC7. understand the type of mounting and other accessories (Steel Mounting bolt, Module attachment and grounding clip, Module spacer, Anodized aluminum mounting foot, Integrated butyl tape sealant) required	1	2	-	-
<i>Identify the installation requirement</i>	8	12	-	-
PC8. assess the degree of inclination and angle of tilt of PV module for the specific area, locality or region to enable the system absorb maximum annual sunlight	1	1	-	-
PC9. ensure that sunlight falls perpendicular to the PV module to absorb maximum energy	1	2	-	-

	PC10. ensure that panels are mounted in a place where there is no shade at any time of the year	1	2	-	-
	PC11. ensure that mounting is strong to withstand wind, rain, etc.	1	1	-	-
	PC12. ensure that any special construction requirement for mounting is done by following acceptable quality standards, especially, in rooftop installations	1	1	-	-
	PC13. use approved tools for mounting	1	1	-	-
	PC14. set the mounting fixture firmly at the desired location	2	2	-	-
	<i>Installing the panel</i>	8	17	-	-
	PC15. remove packaging of the solar panel carefully	1	1	-	-
	PC16. handle the panels carefully without damaging the material	1	2	-	-
	PC17. take safety measures and wear protection gear such as gloves to avoid shock / injuries while handling modules	1	2	-	-
	PC18. cover the module with opaque material while installing to avoid any current generation	1	2	-	-
	PC19. ensure that junction box is covered	1	2	-	-
		-	2	-	-

	PC20. do not disturb or disassemble any part of the module part during installation				
	PC21. take necessary precautions for fire resistance of modules	-	2	-	-
	PC22. use recommended material of solar cable and plugs for electrical connection	1	1	-	-
	PC23. install spare fuse to avoid any short circuits as per company policy	1	1	-	-
	PC24. mount the module on the fixture with the mounting rails using bolts and nuts	1	1	-	-
	PC25. ensure that the panels are mounted firmly	-	1	-	-
	<i>Connecting the system and check for functioning</i>	6	10	-	-
	PC26. use the recommended cables to connect multiple PV modules in combination to generate the desired voltage and current	1	1	-	-
	PC27. choose type of connection, i.e., series or parallel, as per design	1	3	-	-
	PC28. check the maximum system voltage as per the installation and follow adjustment measures accordingly to match output requirement	1	1	-	-
	PC29. ensure that the modules are grounded as specified	1	2	-	-
	PC30. connect the system and check its functioning	1	1	-	-

PC31. escalate for any issues faced during the functioning of the system	1	2	-	-
<i>Completing the work</i>	4	5	-	-
PC32. remove all the tools, consumables used and clean the work area after completing the installation activity	1	2	-	-
PC33. fill in the job completion form and get the signature of the customer	1	1	-	-
PC34. inform customers about maintenance of solar panels and procedure of solar panels cleaning	1	1	-	-
PC35. follow company standards in documentation of installation activities performed	1	1	-	-
<i>Following quality and safety procedures</i>	6	8	-	-
PC36. remove any metals or jewellery to avoid possibility of current shock during installation activity	1	1	-	-
PC37. wear all safety gears such as work shoes, cotton gloves, goggles while carrying out installation activities	1	1	-	-
PC38. take specified precautionary measures while handling electrical system	1	1	-	-
PC39. keep work area clean and organised	-	1	-	-

	PC40. adhere to relevant health and safety standards	-	1	-	-
	PC41. dispose-off any waste materials in accordance with safe working practices and procedures	1	1	-	-
	PC42. Prepare the site for masonry work by marking layout, clearing debris, and leveling the surface for installation.	1	1	-	-
	PC43. Perform masonry work like drilling, grouting, and fixing mounting structures as per specifications.	1	1	-	-
	NOS Total	35	65	-	-
DGT/VSQ/N0101: Employability Skills (30 Hours)	<i>Introduction to Employability Skills</i>	1	1	-	-
	PC1. identify employability skills required for jobs in various industries	-	-	-	-
	PC2. identify and explore learning and employability portals	-	-	-	-
	<i>Constitutional values – Citizenship</i>	1	1	-	-
	PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.				
		-	-	-	-
	PC4. follow environmentally sustainable practices	-	-	-	-
	<i>Becoming a Professional in the 21st Century</i>	2	4	-	-
	PC5. recognize the significance of 21st Century Skills for employment				
		-	-	-	-

	PC6. practice the 21st Century Skills such as Self- Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
	<i>Basic English Skills</i>	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 requirements				
		-	-	-	-
	NOS Total	20	30	-	-
Grand Total		90	160	-	

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.
 - If the batch size is more than 30, then there should be 2 Assessors.
 - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
 - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
 - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
 - Check the availability of the Lab Equipment for the particular Job Role.
3. Assessment Quality Assurance levels / Framework:
 - Question papers created by the Subject Matter Experts (SME)
 - Question papers created by the SME verified by the other subject Matter Experts
 - Questions are mapped with NOS and PC
 - Question papers are prepared considering that level 1 to 3 are 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

On the Job: Each module (which covers the job profile of Solar Panel Installation Technician) will be assessed separately.

1. The candidate must score 50% in each module to successfully complete the OJT.
2. 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
 - Answer Sheets of Question Banks
 - Assessing the Log Book entries of Trainees at Employer location
 - Employer Performance Feedback.
3. Assessment of each Module will ensure that the candidate is able to:
 - Understand the basic principles of AC, DC and electronic circuits.
 - Work effectively at the workplace
 - Basic health and safety practice.

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