QUALIFICATION FILE

Product Assembly Assistant (Solar-LED)

☒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: 3

Submitted By:

NATIONAL INSTITUTE OF ELECTRONICS AND INFORMATION TECHNOLOGY

Plot No. 3, PSP Pocket, Sector-8,
Dwarka, New Delhi-110077

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Section 1: Basic Details

<table>
<tr><td>1.</td><td>Qualification Name</td><td colspan="2">Product Assembly Assistant (Solar-LED)</td></tr>
<tr><td>2.</td><td>Sector/s</td><td colspan="2">Electronics</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:
2020/ITES/NIELIT/03889</td><td>Qualification Name of existing/previous version:
Solar-LED Lighting Product (Design and Manufacturing)</td></tr>
<tr><td>4.</td><td>a. OEM Name
b. Qualification Name</td><td colspan="2">NA</td></tr>
<tr><td>5.</td><td>National Qualification Register (NQR) Code & Version</td><td>QG-03-EH-00992-2023-V2-NIELIT</td><td>6. NCrF/NSQF Level: 3</td></tr>
<tr><td>7.</td><td>Award (Certificate/Diploma/Advance Diploma/ Any Other</td><td colspan="2">Certificate</td></tr>
<tr><td>8.</td><td>Brief Description of the Qualification</td><td colspan="2">The qualification spans diverse subjects concerning electrical and electronic components and devices, emphasizing the design, assembly, and utilization of solar-LED lighting products. Enrollees will acquire crucial skills and knowledge encompassing the conceptualization of electronic components and devices, LED characteristics and specifications, power conversion from AC-DC to DC-DC, LED driver circuit design, assembly of LED lighting products, characteristics of solar PV cells, batteries suitable for solar-LED lighting products, and the design, assembly, and installation of solar-LED lighting products.</td></tr>
<tr><td>9.</td><td>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification:
<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>10th Class Pass</td><td>NA</td></tr>
<tr><td>2.</td><td>8th Class Pass</td><td>2 years of Experience in Electronics/Electrical/Allied Sector</td></tr>
<tr><td>3.</td><td>8th Pass and pursuing continuous schooling in regular school with vocational subject</td><td>NA</td></tr>
<tr><td>4.</td><td>8th with 2 years of NTC after 8th</td><td>-</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td></td><td colspan="2">b. Age:16 Years</td></tr>
<tr><td>10.</td><td>Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td>11 Credits</td><td>11. Common Cost Norm Category (I/II/III)
(wherever applicable):
Category-II</td></tr>
<tr><td>12.</td><td>Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)</td><td colspan="2">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 the requirement of the qualification)</td><td colspan="2">☒Offline ☐ Online ☐ Blended
<table>
<tr><th>Training Delivery Modes</th><th>Theory (Hours)</th><th>Practical (Hours)</th><th>OJT (Hours)</th><th>ES</th><th>Total (Hours)</th></tr>
<tr><td>Classroom (offline)</td><td>90</td><td>180</td><td>30</td><td>30</td><td>330</td></tr>
</table></td></tr>
<tr><td>14.</td><td>Aligned to NCO/ISCO Code/s (if no code is available mention the same)</td><td colspan="2">NCO Code
3113.1001, 3113.1002</td></tr>
<tr><td>15.</td><td>Progression path after attaining the qualification
(Please show Professional and Academic progression)</td><td colspan="2">Academic:
After completion of this course, students can go for other advance courses.

Professional:

Product Assembly Assistant (Solar-LED) ->Product Assembly Engineer (Solar-LED) -> Design and Manufacturing Entrepreneur (Solar-LED Lighting Product).</td></tr>
<tr><td>16.</td><td>Other Indian languages in which the Qualification & Model Curriculum are being submitted</td><td colspan="2">Only English.</td></tr>
<tr><td>17.</td><td>Is similar Qualification(s) available on NQR-if yes, justification for this qualification</td><td colspan="2">☐ Yes ☒ No URLs of similar Qualifications:</td></tr>
</table>

18.	**Is the Job Role Amenable to Persons with Disability**	**☒ Yes ☐ No** **If "Yes", specify the applicable type of Disability:** *a. Locomotor Disability* *i. Leprosy Cured Person* *ii. Dwarfism* *iii. Muscular Dystrophy* *iv. Acid Attack Victims*	
19.	**How Participation of Women will be Encouraged**	Through funding from the Government under various schemes and projects.	
20.	**Are Greening/ Environment Sustainability Aspects Covered** *(Specify the NOS/Module which covers it)*	**☐ Yes ☐ No☒ NA**	
21.	**Is Qualification Suitable to be Offered in Schools/Colleges**	**Schools☐ Yes ☒ No Colleges ☐ Yes ☒ No**	
22.	**Name and Contact Details of Submitting / Awarding Body SPOC** *(In the case of CS or MS, provide details of both Lead AB & Supporting ABs)*	From NIELIT: Name: Dharmendra Kumar Tripathi (Principal Technical Officer) Email: dkt@nielit.gov.in Contact No: 8317093884 Website: https://www.nielit.gov.in	
23.	**Final Approval Date by NSQC: 29/09/2023**	**24. Validity Duration: 3 Years**	**25. Next Review Date: 29/09/2026**

Section 2: Module Summary

NOS/s of Qualifications

1. **Conceptualizing Electronic Components and Devices**
2. **LED characteristics & specification.**
3. **AC-DC and DC-DC power conversion.**
4. **Design of LED Driver circuit.**
5. **LED lighting products Assembly.**
6. **Solar PV cell: Characteristics, parameter and specification.**
7. **Batteries for Solar-LED lighting Products**
8. **Design, assembly and installation of Solar-LED Lighting Products.**

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***	***Total***	***Theory***	***Practical***	***Project***	***Total***	***Weightage***
1.	NOS 1:Conceptualizing Electronic Components and Devices	NOS Code: NIE/ELE/N0909 NOS Version- 1.0	*Core*	3	1.5	15	30	0	45	25	15	0	40	11
2.	NOS2: LED characteristics	NOS Code:	*Core*	3	1.5	15	30	0	45	25	15	0	40	11

	& specifications	NIE/ELE/N0902 NOS Version- 1.0												
3.	NOS3: AC-DC and DC-DC power conversion	NOS Code: NIE/ELE/N0904 NOS Version- 1.0	*Core*	3	1	10	20	0	30	25	10	0	35	10
4.	NOS4: Design of LED Driver circuit	NOS Code: NIE/ELE/N0905 NOS Version- 1.0	*Core*	3	1	10	20	0	30	25	10	0	35	10
5.	NOS5: LED lighting products Assembly	NOS Code: NIE/ELE/N0906 NOS Version- 1.0	*Core*	3	1	10	20	0	30	25	10	0	35	10
6.	NOS6: Solar PV cell: Characteristics, parameter and specification	NOS Code: NIE/ELE/N0907 NOS Version- 1.0	*Core*	3	1	10	20	0	30	25	10	0	35	10
7	NOS7: Batteries for Solar-LED lighting Products	NOS Code: NIE/ELE/N0908 NOS Version- 1.0	*Core*	3	1	10	20	0	30	25	10	0	35	10
8	NOS8: Design, assembly and installation of Solar-LED Lighting Products.	NOS Code: NIE/ELE/N0903 NOS Version- 1.0	*Core*	3	1	10	20	0	30	25	10	0	35	10

					Sub-Total	90	180	0	270	200	90	0	290	82
9	NOS9: Employability Skills	NOS Code: DGT/VSQ/N0101 NOS Version- 1.0	*Non-Core*	3	1	30	0	0	30	0	0	0	30	9
10	Project/ OJT		***Non-Core***	3	1	0	0	30	30	0	0	30	30	9
Total					**11**	**120**	**180**	**30**	**330**	**350**				**100**

Assessment Components	**NOS Included**	**Duration (in mins)**	**Marks**
Theory Paper 1: Electronic Components and Devices, LED characteristics & specification, AC-DC and DC-DC power conversion, Design of LED Driver circuit.	NOS 1, NOS 2, NOS 3, NOS 4	90	100
Theory Paper 2: LED lighting products Assembly, Solar PV cell: Characteristics, parameter and specification, Batteries for Solar-LED lighting Products, Design assembly and installation of Solar-LED Lighting Products.	NOS 5, NOS 6, NOS 7, NOS 8	90	100
Practical	NOS 1, NOS 2, NOS 3, NOS4, NOS 5, NOS 6,	180	90

	NOS 7, NOS 8		
Internal Assessment	NOS 9	-	30
Project	NOS 1, NOS 2, NOS 3, NOS4, NOS 5, NOS 6, NOS 7, NOS 8	-	30
			Total: 350

******Assessment strategy shall be as per NIELIT Norms prevailing at times***.

Minimum Pass Percentage – The pass percentage is 50% in each assessment component (as mentioned in the above table) with the aggregate pass percentage be 50%

Section 3: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	B. Tech in Electrical Engineering/ Electronics and Communication/ allied branches With 1 Years of Experience in teaching specialization on Solar-LED Based lighting Product Designing
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	B. Tech in Electrical Engineering/ Electronics and Communication/ allied branches and 3 Years of Experience in teaching
3.	**Tools and Equipment Required for Training**	☒Yes ☐No Details available in Annexure-II
4.	**In Case of a 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)*	As per the examination SOP of NIELIT with a minimum qualification of B. Tech in Electrical Engineering/ Electronics and Communication/ allied branches and 2 year experience in Solar-LED Based lighting product Designing.
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	The assessor carries out theory online assessments through the remote proctoring methodology. Theory examination would be conducted online and the paper comprises MCQ. Conduct of assessment is through trained proctors. Once the test begins, remote proctors have full access to the candidate's video feeds and computer screens. Proctors authenticate the candidate based on registration details, pre-test image captured and I-card in possession of the candidate. Proctors can chat with candidates or give warnings to candidates. Proctors can also take screenshots, terminate a specific user's test session, or re-authenticate candidates based on video feeds. The Qualification required for proctor is B.Tech or Equivalent as per NCrF with experience in relevant industry.
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	External Examiners/ Observers (Subject matter experts) are deployed including NIELIT scientific officers who are subject experts for evaluation of Practical examination/ internal assessment / Project/ Presentation/ assignment and Major Project (if applicable). Qualification is B.Tech 1 year industry experience and specialization on relevant domain.
4.	**Assessment Mode** *(Specify the assessment mode)*	Online for Theory Online/ Offline/ Blended for other assessment components depending on the region where the assessment is conducted
5.	**Tools and Equipment Required for Assessment**	☒ Same as for training ☒ Yes ☐ No (D*etails to be provided in Annexure-II)*

Section 5: Evidence of the need for the Qualification

1.	**Latest Skill Gap Study (not older than 2 years) (Yes/No):Yes, Available on Annexure-C**
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.	**The number of Industry validation provided:** 6
5.	**Estimated nos. of persons to be trained and employed:** 1000 persons per year shall be trained.
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** NIELIT is recognized as AB and AA under Government Category. NIELIT is an HRD arm of MeitY, therefore, the Line Ministry Concurrence is not required.

Section 6: Annexure & Supporting Documents Check List

1.	**Annexure:** NCrF/NSQF level justification based on NCrF level/NSQF descriptors *(Mandatory)*	***Available at Annexure-I:*** **Evidence of Level**
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of the online course)*	***Available at*** **Annexure-II: Tools and Equipment**
3.	**Annexure:** Industry Validation (Mandatory**)**	***Yes,*** ***Available at*** **Annexure-III: Industry Validation Summary**
4.	**Annexure: Training & Employment Projection(Mandatory)**	***Yes,*** ***Available at*** **Annexure-IV**: **Training & Employment Details**
5.	**Annexure:** Blended Learning *(Mandatory, in case the selected Mode of delivery is "Blended Learning")*	**Available at Annexure-V: Blended Learning**

6.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	***Available at*** **Annexure-VI: Detailed Assessment Criteria**
7.	**Annexure:** Assessment Strategy *(Mandatory)*	***Available at*** **Annexure-VII: Detailed Assessment Strategy**
8.	**Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification, has multiple Entry-Exit)*	***NA***
9.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	***Available at Annexure-VIII: Career Progression***
10.	**Supporting Document:** Occupational Map *(Mandatory)*	***Available at Annexure-IX: Occupational Map***
11.	**Annexure:** Acronym and Glossary *(Optional)*	***Available at Annexure-X:*** **Acronym and Glossary**
12.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	***Available at Annexure-A: Model Curriculum***
13.	**Supporting Document:** Assessment SOP *(Mandatory)*	***Available at Annexure-C: Examination SoP***
14.	**Any other document you wish to submit:**	***NA***

Annexure I: 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	1. The individual will have in depth knowledge and understanding of design and manufacturing aspect of Solar-LED Lighting Productand their types. 2. The individual will be able to assemble Solar-LED Lighting Product for a given spec.	1. Possesses specialized operational knowledge and understanding of the work. 2. Have complete knowledge of the concept of time required for delivery; and Quality for a range of issues	3
Professional and Technical Skills/ Expertise/ Professional Knowledge	Check the non-functional LED Light in as per standardprocedure to find outthe fault; dismantle theLED Light; repair thefault and reassemble the light to make itfunctional and How toDesign Solar PVSystem.	The skill set acquired by the candidate would Encompass Installation, Configuration, designing , implementation of LED based products and SPV systems	3
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	1. Introduction to Employability Skills 2. Career Development & Goal Setting 3. Basic English Skills 4. Communication Skills 5. Essential Digital Skills 6. Customer Service 7. Entrepreneurship 8. Diversity & Inclusion 9. Getting Ready for Apprenticeship & Jobs	Can explain Entrepreneurial Mindset and describe the importance of it in the context of opportunity curation for future jobs	3

Broad Learning Outcomes/Core Skill	The individual on the job needs to know and understand how to Read and understand technical manuals, work orders and reports Read and understand Solar-LED Lighting Products safety instructions Fill up record sheets clearly, concisely and accurately as per company procedures Clearly communicate relevant information to supervisors Respond appropriately to queries Prioritize and execute tasks in a high-pressure environment	Language to communicate written or oral, with required clarity.	3
Responsibility	After successful competition of this course, participant will be acquainted with the necessary Hardware and Software skills for Installation, Repair, Maintenance and Troubleshooting of Solar-LED Lighting Product. Participants will be a “Ready to Observe” product for Solar-LED LightingProduct manufacturing sector.	1. Takes complete responsibility for delivery and quality of own work and output as also the subordinates. 2. Shares responsibility for the group tasks.	3

Annexure-II: 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	Classroom	1 (30 Sq.m)	30
2	Student Chair	30	30
3	Student Table	30	30

4	Resistance of different value & Wattage ratings · Capacitor of different types · Transistors – BC 546, BC 547, SL 100, 2N3055 · Rectifier Diode · Step down Transformers of different ratings · Zener Diode of different values · LED of different colours and wattages for lighting purposes · Electronics & Electrical Tool Kit (5 nos) · 3 Pin Voltage Regulators(7805,7905,7812,7912)- 3 nos each · Connecting wires · Logic GATE ICs PWM IC's (TL 494, LD7575PS,DAP008) · OPAMP/Comparator(LM 324,LM 339) · Digital Multimeter (5 nos) · CRO (2 nos) · Function Generator (2 nos) · DC Regulated Power Supply (0-15V, 10 A) (2 nos) · Linear & Digital IC Tester (2 nos) · Clamp meter (AC/DC) (2 nos) · Soldering Iron (5nos) · Solder Wire(80/20) · Soldering Flux(liquid/paste) Microwatt Soldering Iron (3 nos) · Desoldering Station (2 nos) · Desoldering Pump (2 nos) · Power Inverter sets (2 nos) · Stabilizer/CVT(2 nos) · Battery Charger (2 nos) · Solar panels of different wattages & types (min. 5 nos) · Bread board (10 nos minimum) · Lux meter (2nos) · Hot air gun (2nos) · Flux Remover (2 nos)		03 set

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. LCD Projector
2. WhiteBoard

Annexure-III: 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
1	All Computer Solution	Abhishek Kumar	Proprietor	Manas Tiraha Near Munshi Pulia Metro Station, Indira Nagar, Lucknow-226016	9450092017	Gupta7772@gmail.com
2	JGM Enterprises	Chandra Kala Pandey	Proprietor	A-25, Nehru Vihar Colony, Near Telephone Exchange, Kalyanpur, Lucknow	7985859946	Enterprisesjgm19@gmail.com
3	Trans Institute	Girijesh	Director	Yashodakunj, Bashakari Road, Near Bypass Gurukul Nagar, Mubarakpur, Daiyadeeh, Akbarpur Ambedkar Nagar-224122	8317069530	Trans_institute@yahoo.com
4	Manshi Computer Works	Ram Babu Srivastav	Director	Katra Chungi post I T I Distt Basti, UP-272001	7007816213	rambabubastiioc@gmail.com
5	DNIIT	Amit Kumar Tripathi	Director	20, Prime Plaza, Munchi Pulia, Indra Nagar, Lucknow-226016	8765562815	aktjob@gmail.com
6	S R Infotech	Sameer Raout	Proprietor	Sector-B, Near CID Colony, Mahanagar, Lucknow	9336621302	Srinfotech.iko@gmail.com
7	Sagun Enterprises	Arun Kumar	Proprietor	N – 4/4, E – 1/K, Karoundi Crossing, Post – B.H.U., Varanasi-221005	9807564900	enterprisessagun@gmail.com
8	Rudra Infotech	Rudra	Proprietor	Munchi Pulia, Indra Nagar, Lucknow-226016	9335861575	-
9	Commivik Infosystem Private Limited	Vikas	Associate Director	Office-3, 2nd Floor 4A, PS Arcade, Bhoja Market, Sector-27, Noida (U.P)	7889824905	vikas@commivik.com

10	Galaxy Power Services	Dinesh Chandra Pandey	Proprietor	C-659, Near Aravali Chaurah, Church Road, Indra Nagar Lucknow-226016	9415105793	galaxypowerservices@gmail.com
11	Computer Management Services	Sobhajeet Verma	Proprietor	Prime Plaza, Indra Nagar, Lucknow-226016	9519134547	-

Annexure-IV: 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	500	50	100	50	05	2
2024	1000	100	200	100	10	2
2025	1000	100	200	100	10	2

Annexure-V: BlendedLearning(NA)

Blended Learning Estimated Ratio & Recommended Tools: NA

Annexure-VI: 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 & Viva Marks
NOS1: Conceptualizing Electronic Components and Devices NOS Code: NIE/ELE/N0909	1. Identification of Electronic Components. 2. Testing of Passive and active components using Multimeter. 3. Design of rectifier for certain O/P voltage.	25	15	0
NOS2: LED characteristics & specifications NOS Code: NIE/ELE/N0902	1. Draw the VI characteristics of LED, Rectifier diode and Zener diode. 2. Study and Performance measurements of crystal diode and LED. 3. Realizing transistor switching circuit and switching LED ON and OFF. 4. Connecting LEDs together in series and parallel manner to form a string and powering them from external DC power supply to make it glow.	25	15	0
NOS3: AC-DC and DC-DC power conversion NOS Code: NIE/ELE/N0904	1. Design of Unregulated Power Supply. 2. Design of Regulated Power Supply using 3-Terminal voltage regulator ICs. 3. Study of Buck converter, Boost converter and Buck-Boost converter.	25	10	0
NOS4: Design of LED Driver circuit NOS Code: NIE/ELE/N0905	1. Capacitive dropout Driver circuit design. 2. Design of Single transistor constant-current driver, with voltage regulation, alternative to zener diode, LEDswitching using LDR. 3. Driver design using PWM technique	25	10	0
NOS5: LED lighting products Assembly NOS Code: NIE/ELE/N0906	1. Design of Single transistor constantcurrent driver, with voltage regulation, analternative to zener diode, LEDswitching using LDR. 2. Use of various tools like temperature meter, resistance	25	10	0

	thermometer, magnifying glassetc. 3. Benefits of LED assembly, application of LED assembly, LED bulb light, LED spotlight assembly, LED tube light.			
NOS6: Solar PV cell: Characteristics, parameter and specification NOS Code: NIE/ELE/N0907	1. Concepts of solar photo voltaic cells. 2. Working of SPV's, ratings and specifications of SPV peak voltage and voltage/current on load, ratings of PV module, specification of PV module.	25	10	0
NOS7: Batteries for Solar-LED lighting Products NOS Code: NIE/ELE/N0908	1. Battery and its type, Characteristic parameter of Batteries: Nominal Voltage, Current rating, AH rating, life cycle, DoD &SoC. 2. Temperature characteristic of Battery, Testing of Battery. 3. Various type of Batteries for Solar Solar-LED lighting Products: NiCad batteries, Lead-acid batteries, NiMH (Nickel Metal Hydride) batteries, Li-ion batteries, Lithium-Ion Phosphate Batteries. 4. Battery Sizing for Solar-LED lighting Products.	25	10	0
NOS8: Design, assembly and installation of Solar-LED Lighting Products. NOS Code: NIE/ELE/N0903	1. Light Decoration strip realization. 2. System sizing: Solar panel, Battery, LED strip of required color and rating. Appropriate driver module. 3. Development of Prototype model of Solar-LED Lighting Product for a given light intensity (Lumen).	25	10	0
	Total Marks	**200**	**90**	**0**
NOS9: Employability Skills (30 Hours) NOS Code: DGT/VSQ/N0101	1. Acquiring Communication Skills 2. Managing career, staff and professional relationships 3. Preparing for interview. 4. Ways to identify business opportunities. 5. Types of customers and their needs	20	10	0
Nos10: Project/OJT	Project			30
	Grant Total-350	**220**	**100**	**30**

Annexure-VII: Assessment Strategy

Assessment of the qualification evaluates candidates to ascertain that they can integrate knowledge, skills and values for carrying out relevant tasks as per the defined learning outcomes and assessment criteria.

The underlying principle of assessment is fairness and transparency. The evidence of the outcomes and assessment criteria. Competence acquired by the candidate can be obtained by conducting Theory (Online), Practical assessment, internal assessment, Project/Presentation/ Assignment, Major Project. The emphasis is on the practical demonstration of skills & knowledge gained by the candidate through the training. Each OUTCOME is assessed & marked separately. A candidate is required to pass all OUTCOMES individually based on the passing criteria.

About Examination Pattern:

1. The question papers for the theory and practical exams are set by the Examination wing (assessor) of NIELIT HQS.
2. The assessor assigns roll number.
3. The assessor carries out theory online assessments through remote proctoring methodology. Theory examination would be conducted online and the paper comprise of MCQ. Conduct of assessment are through trained proctors. Once the test begins, remote proctors have full access to candidate's video feeds and computer screens. Proctors authenticate the candidate based on registration details, pre-test image captured and I- card in possession of the candidate. Proctors can chat with candidates or give warnings to candidates. Proctors can also take screenshots, terminate a specific user's test session, or re-authenticate candidates based on video feeds.
4. An External Examiner/ Observer may be deployed including NIELIT officials for evaluation of Practical examination/ internal assessment / Project/ Presentation/. Major Project (if applicable) would be evaluated preferably by external/ subject expert including NIELIT officials.
5. Pass percentage would be 50% marks in each component.
6. Candidates may apply for re-examination within the validity of registration (only in the assessment component in which the candidate failed).
7. For re-examination prescribed examination fee is required to be paid by the candidate only for the assessment component in which the candidate wants to reappear.
8. There would be no exemption for any paper/module for candidates having similar qualifications or skills.
9. The examination will be conducted in English language only.

Quality assurance activities: A pool of questions is created by a subject matter expert and moderated by other SME. Test rules are set beforehand. Random set of questions which are according to syllabus appears which may differ from candidate to candidate. Confidentiality and impartiality are maintained during all the examination and evaluation processes.

Annexure-VIII: Career Progression:

Academic:

Higher level course in Solar power system and LED Lighting product Design and Installation &Maintenance

Professional:

Design and Manufacturing Assistant ->Design and Manufacturing Engineer->Design and ManufacturingEntrepreneur(Solar-LED Lighting Product).

Annexure-X: 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