QUALIFICATION FILE–Standalone NOS

Fundamentals of Embedded Product Design

☐ **Horizontal/Generic** ☐**Vertical/Specialization**

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

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

NCrF/NSQF Level: 5

Submitted By:

NATIONAL INSTITUTE OF ELECTRONICS AND INFORMATION TECHNOLOGY (NIELIT)

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Section 1: Basic Details

1.	**NOS-Qualification Name**	**Fundamentals of Embedded Product Design**	
2.	**Sector/s**	Electronics	
3.	**Type of Qualification ☒ New ☐ Revised**	**NQR Code & version of the existing /previous qualification: NA**	**Qualification Name of the existing/previous version: NA**
4.	**National Qualification Register (NQR) Code & Version**	NG-05-EH-02896-2024-V1-NIELIT	**5. NCrF/NSQF Level: 5**
6.	**Brief Description of the Standalone NOS**	The course aims to provide a comprehensive understanding of embedded systems design, focusing on product development, programming aids, protocols and interfacing, and microcontroller-based design. It prepares students to handle real-world challenges in designing, integrating, and testing embedded systems, ensuring they are well-equipped for industry demands.	

7.	**Eligibility Criteria for Entry for a Student/Trainee/Learner/Employee**	**a. Entry Qualification & Relevant Experience:**	
		S. No. / **Academic/Skill Qualification (with Specialization - if applicable)**	**Relevant Experience (with Specialization - if applicable)**
		1 / 2nd year of UG in Electronics and Communication Engineering/ Electrical Engineering/CS/IT/Physics/Electronics and allied branches	NA
		2 / 3 Years of Diploma in Electronics and Communication Engineering/ Electrical Engineering/CS/IT/Physics/Electronics and allied branches after class 10th	1.5 Years
		3 / 2 Year of diploma in Electronics and Communication Engineering/ Electrical Engineering/CS/IT/Physics/Electronics and allied branches after class 12th	NA
		4 / NSQF Level 4.5 in Electronics and Communication Engineering/ Electrical Engineering/CS/IT/Physics/Electronics and allied branches	1.5 Years

5	NSQF Level 4 Electronics and Communication Engineering/ Electrical Engineering/CS/IT/Physics/Electronics and allied branches		1.5 Years
	b. Age:18 years		

8.	**Credits Assigned to this NOS-Qualification, Subject to Assessment** *(as per National Credit Framework (NCrF))*	2 Credits	**9.**	**Common Cost Norm Category (I/II/III)** *(wherever applicable)*: Category I (Electronics System Design)

10.	**Any Licensing Requirements for Undertaking Training on This Qualification** *(wherever applicable)*	NA

11.	**Training Duration by Modes of Training Delivery** *(Specify **Total Duration** as per selected training delivery modes and as per requirement of the qualification)*	☒Offline ☐ Online ☐ Blended

Training Delivery Mode	Theory (Hours)	Practical (Hours)	Total (Hours)
Classroom (offline)	30	30	60

Training shall be conducted in any of the 3 modes depending on the regional need.

(Refer Blended Learning Annexure-V for details)

12.	**Assessment Criteria**

Theory (Marks)	Practical (Marks)	Project/ Presentation /Assignment (Marks)	Viva/ Internal Assessment (Marks)	Total (Marks)	Passing %age
100	**60**	**20**	**20**	**200**	**50**

The centralized online assessment is conducted by the Examination Wing, NIELIT Headquarters.

13.	**Is the NOS Amenable to Persons with Disability**	☒ **Yes** ☐ **No** **If "Yes", specify applicable type of Disability:** a. Locomotor Disability: Leprosy Cured Person, Dwarfism, Muscular Dystrophy and Acid Attack Victims b. Visual Impairment: Low Vision

14.	**Progression Path After Attaining the Qualification, wherever applicable**	Embedded Software Engineer

15.	**How will the participation of women be encouraged?**	Participation by women can be ensured through Government Schemes. Occasionally, exclusive batches for women would be run for the proposed courses. Funding is available for women's participation under other schemes launched by the Government from time to time.
16.	**Other Indian languages in which the Qualification & Model Curriculum are being submitted**	Qualification file available in English & Hindi Language.
17.	**Is similar NOS available on NQR-if yes, justification for this qualification**	☐Yes ☒ **No**
18.	**Name and Contact Details Submitting / Awarding Body SPOC** *(In the case of CS or MS, provide details of both Lead AB & Supporting ABs)*	**Name:** Rajesh M **Email:** rajesh.m@nielit.gov.in **Website:** https://nielit.gov.in/ **Name:** Anirban Jyoti Hati **Email:** anirban@nielit.gov.in **Website:** https://nielit.gov.in/ **Name:** Ankit Kumar **Email:** ankit@nielit.gov.in **Website:** https://nielit.gov.in/
19.	**Final Approval Date by NSQC: 25.07.2024**	**20. Validity Duration: 3 years** **21. Next Review Date: 25.07.2027**

Section 2: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)**	B.E./B. Tech in Electronics/ Electronics & Communication/ Electrical/ Electrical and Electronics/Instrumentation/ Electronics & Instrumentation / Instrumentation & Control /Computer Science/Information Technology Minimum 2 year of experience in the field of Embedded Systems Development
2.	**Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)**	B.E./B. Tech in Electronics/ Electronics & Communication/ Electrical/ Electrical and Electronics/Instrumentation/ Electronics & Instrumentation / Instrumentation & Control /Computer Science/Information Technology Minimum 3 year of experience in the field of Embedded Systems Development
3.	**Tools and Equipment Required for the Training**	☒ Yes ☐No Available at Annexure-II
4.	**In Case of Revised NOS, details of Any Upskilling Required for Trainer**	Not Applicable

Section 3: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	B.Tech or Equivalent as per NCrF + 3 years relevant experience
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines), (wherever applicable)*	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.
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 generally B.Tech
4.	**Assessment Mode***(Specify the assessment mode)*	Centralized online examination will be conducted
5.	**Tools and Equipment Required for Assessment**	Same as for training ☒ Yes ☐ No

Section 4: Evidence of the Need for the Standalone NOS

1.	Government /Industry initiatives/ requirement (Yes/No): Yes, Available at Annexure-A: Evidence of Need
2.	Number of Industry validations provided: 8
3.	Estimated number of people to be trained: 500 persons per year shall be trained.
4.	Evidence of Concurrence/Consultation with Line/State Departments (In case of regulated sectors): 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.
5.	Latest Skill Gap Study (not older than 2 years) (Yes/No): Yes, Available in Annexure-A: Evidence of Need
6.	Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): Yes, Available at Annexure-A: Evidence of Need

Section 5: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name.

1.	**Annexure:** NCrF/NSQF level justification based on NCrF/NSQF descriptors *(Mandatory)*	*Available at* Annexure-I: Evidence of Level
2.	**Annexure:** List of tools and equipment relevant for NOS *(Mandatory, except in case of online course)*	*Available at* Annexure-II: Tools and Equipment
3.	**Annexure: Industry Validation**	*Available at* Annexure-III: Industry Validation
4.	**Annexure: Training Details**	*Available at* Annexure-IV: Training Details
5.	**Annexure:** Blended Learning *(Mandatory, in case the selected Mode of delivery is Blended Learning)*	*Available at* Annexure-V: Blended Learning
6.	**Annexure/Supporting Document:** Standalone NOS-Performance Criteria Details Annexure/Document with PC-wise detailing as per NOS format (Mandatory- Public view)	*Available at* Annexure-VI: Standalone NOS- Performance Criteria details
7.	**Annexure:** Performance and Assessment Criteria *(Mandatory)*	*Available at* Annexure-VII: Detailed Assessment Criteria
8.	**Annexure:** Assessment Strategy *(Mandatory)*	*Available at* Annexure-VIII: Assessment Strategy
9.	**Annexure:** Acronym and Glossary *(Optional)*	*Available at* Annexure-IX: Acronym and Glossary

10.	**Supporting Document:** Model Curriculum	*Available at* Annexure-C: Model Curriculum

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	• Acquiring deep knowledge of system-level design principles encompassing both hardware and software components in product development. • Capability to apply theoretical knowledge to accurately represent algorithms, processes, and decision-making logic using flowcharts, while avoiding common mistakes made when creating them. • Ability to analyze, select, and implement suitable protocols and strategies for interfacing sensor and wireless modules with microcontrollers, considering theoretical aspects alongside practical implementation challenges.	• This outcome enhances theoretical knowledge by providing a conceptual understanding of how scripting languages are applied in embedded systems. • This outcome involves theoretical knowledge about specific scripting libraries tailored for embedded systems. • This outcome contributes to theoretical knowledge by exposing learners to a range of scripting libraries used in embedded development.	5
Professional and Technical Skills/ Expertise/ Professional Knowledge	• Ability to architect and design complex systems integrating hardware and software components. • Capability to develop embedded systems solutions with a focus on integration and testing. • Ability to design printed circuit boards (PCBs) using tools like ORCAD and oversee the prototyping process.	• Ability to architect and design complex systems integrating hardware and software components requires a deep understanding of system architecture, hardware design principles, and software integration. • Capability to develop embedded systems solutions with a focus on integration and testing is closely related to technical skills in embedded systems development.	5

Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	• Proficient in creating robust designs that meet product specifications and performance criteria, ensuring readiness for market introduction. • Efficient in managing project budgets and maximizing profitability, crucial for entrepreneurial success. • Ensures the ability to design systems that communicate effectively, crucial for developing innovative embedded solutions.	• Entrepreneurs equipped with the ability to create robust designs can bring products to market more efficiently and confidently, ensuring customer satisfaction and reducing the risk of product failures. • Employers seek candidates who can design systems with effective communication protocols. This is essential for developing complex embedded systems that require seamless interaction between different components.	5
Broad Learning Outcomes/ Core Skill	• Able to develop and implement complex embedded systems by integrating hardware and software components effectively. • Skilled in developing efficient and reliable embedded software solutions by utilizing structured programming techniques, flowcharts, and following best practices. • Ability to make informed decisions regarding the selection of hardware components based on cost considerations, quality, and functionality.	• Ability to seamlessly integrate hardware components with software solutions, ensuring that both function together optimally. • Developing software that optimally utilizes system resources, ensuring performance and energy efficiency. • Ability to evaluate components based on cost, quality, and functionality to make economically sound decisions.	5
Responsibility	• Course should equip learners with the responsibility to effectively use scripting languages like Python, Bash, and Tcl/Tk for embedded systems development. • Learners should be able to responsibly interact with embedded hardware components such as GPIO pins, sensors, actuators, and microcontrollers using scripting languages.	• The responsibility to effectively use scripting languages like Python, Bash, and Tcl/Tk for embedded systems development entails ethical considerations. • The ability to responsibly interact with embedded hardware components using scripting languages involves a profound sense of responsibility.	5

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 (750 Sq. ft to 1000 Sq. ft.)	30
2	Students Chair	30	30
3	Students Table	15 (2 students sharing 1 table)	15
4	Desktop computer with accessories / Laptop	Laptop with minimum specifications: Intel I3 or Celeron processor with at least 8GB RAM, 512GB SSD Hard disk integrated with graphics card, Display size 15.6-inch, Wi-Fi connectivity and Wired Optical Mouse	15
5	Internet Connectivity	Seamless internet connectivity with at least 100 Mbps without firewall	
6	Development Board & Tools	ORCAD software, microcontrollers, sensors, wireless modules, development boards, flowcharting software, and access to hardware prototyping components.	15

Classroom Aids for offline and blended mode of training:

The aids required to conduct sessions in the classroom are:

1. LCD Projector/Smart Board

Annexure III: Industry Validations/ Government Recognition Summary

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID
1	Aajivika Global Skill Private Limited	Mukesh Kumar Verma	Director	Beside Vishal Trade, dasmile chowk, Khunti Road Ranchi, Jharkhand-835221	9507952882	aajivikaglobal@gmail.com
2	AISECT Ltd.	Teena Panthi	Assistant Manager	AISECT Ltd. 1-1-387, 3rd floor, Flat No. 403/404, GNR Heights, Above SBI,Bakaram Road, Musheerabad, Hydrabad-500020	7879982075	Teena.panthi@aisect.org
3	B. G. Infotech	Amal Das	Centre Head	Kakdihi, Mecheda, Purba, Medinipur	9434996748	Bginfotech2007@gmail.com
4	Devendra Nath Institute of Information Mation Technology (DNIIT)	Amit Kumar Tripathy	Director	Uska Road, Near Naveen Sabji Mandi, Tetari Bazar, Siddharth Nagar-272207	8765562815	aktjob@gmail.com
5	Inditech Software Wizard Pvt. Ltd.	Sandip Ghosh	Course Coordinator	Mohiari Chanpiritala, Po: Andul Mouri, PS: Domjur, Distt: Howrah, West Bengal-711302	9230027415	swizardrecruitment@gmail.com
6	Prasanthi Polytechnic	D. Prasad	Principal	Duppituru (Vill), Atchutapuram (Md). Visakhapatnam (Dist), Andhara Pradesh-531011	9849952573	prasadreddy.1279@gmail.com
7	Sidhi Vinayak Academy	Neha Verma	Director	Shiv Narayan Kunj, B Block, Shivaji Nagar, Hethu, Ranchi, JH-834002	8789837772	sidhiacadmey@gmail.com
8	Surekha IT Services	Anjani K	Manager	8-3-191/84/302, Sharan Residency, Vengalrao Nagar, Hyderabad-500038, Telangana	8125134134	info@surekhaitservices.com

Annexure IV: Training Details

Training Projections:

Year	Estimated Training # of Total Candidates	Estimated training# of Women	Estimated training# of People with Disability
2024-25	500	200	20
2025-26	500	200	20
2026-27	1000	200	20

Data to be provided year-wise for the next 3 years.

Annexure V: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

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	Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc.	70:30
2	Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc.	70:30
3	Showing Practical Demonstrations to the learners	Through Virtual Software and Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc.	70:30
4	Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	Through Virtual Software and Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc.	70:30
5	Tutorials/ Assignments/ Drill/ Practice	Online interaction platforms like JitSi Meet, Bharat VC, Google Meet, MS Teams, etc.	70:30
6	Proctored Monitoring/ Assessment/ Evaluation/ Examinations	NIELIT Remote Proctored Software	Online: 100% Theory Offline: 100% Practical
7	On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	Virtual Software Platform	Either 100% online in a virtual environment Or 100% offline in the Industry.

Annexure VI: Standalone NOS- Performance Criteria details

1. Description

This comprehensive course equips learners with the knowledge and skills required for product development, offering in-depth insights into system level design, hardware-software integration, and co-verification, along with cost analysis.

2. Scope

The scope of the course encompasses theoretical understanding, practical application, and hands-on experience in various aspects of product development, programming aids, embedded protocols, and microcontroller-based design. Students will have the opportunity to delve into the complexities of system design, programming techniques, hardware integration, and hardware design using industry-standard tools and methodologies.

3. Elements and Performance Criteria

System Level Design using Hardware and Software:

- Student can effectively integrate hardware and software components to create a cohesive system, showcasing a deep understanding of system architecture principles.
- Student conducts thorough testing to identify and resolve integration issues, ensuring the functionality and performance meet specified requirements.
- Student prepares detailed design documentation that outlines the system architecture, hardware-software interactions, and testing results, effectively communicating the design process.

Flowchart Techniques and Best Practices:

- Student accurately represents algorithms and processes using flowcharts, ensuring clarity and correctness in the visual depiction.
- Student applies best practices in flowchart design, including proper symbol usage, consistent formatting, and logical flow, enhancing the readability and understanding of the flowchart.
- Student can identify common mistakes in flowchart design, such as ambiguities or incorrect logic representation, and effectively correct them to improve the quality of the flowchart.

Sensor and Wireless Module Interfacing with Microcontrollers:

- Student can analyze requirements and select suitable protocols for interfacing sensors and wireless modules with microcontrollers, considering factors such as data transfer speed and compatibility.
- Student demonstrates the ability to implement interfacing strategies that ensure reliable communication between sensors, wireless modules, and microcontrollers, minimizing errors and maximizing efficiency.
- Student proficiently troubleshoots interface issues and optimizes the sensor and wireless module integration with microcontrollers to enhance system performance and responsiveness.

4. **Knowledge and Understanding (KU):**

The individual on the job needs to know and understand:

System Level Design using Hardware and Software:

- Understanding of system architecture principles, hardware components, software integration techniques, and testing methodologies.
- Ability to grasp the interplay between hardware and software in system design, including how to address integration challenges and verify system functionality.

Flowchart Techniques and Best Practices:

- Familiarity with different flowchart symbols, flowchart creation techniques, best practices in flowchart design, and common mistakes to avoid.
- Comprehension of how flowcharts visually represent algorithms, decision-making processes, and logic flows, and the ability to apply best practices for creating clear and effective flowcharts.

Sensor and Wireless Module Interfacing with Microcontrollers:

- Knowledge of embedded bus protocols, sensor technologies, wireless communication standards, and strategies for interfacing with microcontrollers.
- Understanding the theoretical aspects of sensor and wireless module integration, the challenges involved in interfacing with microcontrollers, and the ability to select and implement appropriate protocols for efficient communication.

5. Generic Skills (GS):

User/individual on the job needs to know how to:

- Problem-Solving: Ability to identify and address integration issues, testing challenges, and system design constraints.
- Communication: Capability to effectively document and present system architecture and design decisions to stakeholders.
- Critical Thinking: Capacity to logically represent algorithms and decision-making processes using flowcharts, enhancing problem-solving skills.
- Analytical Skills: Competence in analyzing sensor specifications, wireless protocols, and microcontroller capabilities to make informed integration decisions.
- Adaptability: Capacity to troubleshoot and optimize sensor and wireless module interfacing, demonstrating flexibility in addressing real-world implementation challenges.

Annexure VII: Assessment Criteria

Detailed PC-wise assessment criteria and assessment marks for the NOS are as follows:

NOS/Module Name	Assessment Criteria for Performance Criteria	Theory Marks	Practical Marks	Project /Presentation /Assignment Marks	Viva/ Internal Assessment (Marks)
NOS1:Fundamentals of Embedded Product Design **NOS Code: NIE/ELE/N0228**	*System Level Design using Hardware and Software:*	30	20	-	6
	• Student can effectively integrate hardware and software components to create a cohesive system, showcasing a deep understanding of system architecture principles.	-	-	-	-
	• Student conducts thorough testing to identify and resolve integration issues, ensuring the functionality and performance meet specified requirements.	-	-	-	-
	• Student prepares detailed design documentation that outlines the system architecture, hardware-software interactions, and testing results, effectively communicating the design process.	-	-	-	-

	Flowchart Techniques and Best Practices:	40	20	-	7
	• Student accurately represents algorithms and processes using flowcharts, ensuring clarity and correctness in the visual depiction.	-	-	-	-
	• Student applies best practices in flowchart design, including proper symbol usage, consistent formatting, and logical flow, enhancing the readability and understanding of the flowchart.	-	-	-	-
	• Student can identify common mistakes in flowchart design, such as ambiguities or incorrect logic representation, and effectively correct them to improve the quality of the flowchart.	-	-	-	-
	Sensor and Wireless Module Interfacing with Microcontrollers	30	20	-	7
	• Student can analyze requirements and select suitable protocols for interfacing sensors and wireless modules with microcontrollers, considering factors such as data transfer speed and compatibility.	-	-	-	-
	• Student demonstrates the ability to implement interfacing strategies that ensure reliable communication between sensors, wireless modules, and microcontrollers, minimizing errors and maximizing efficiency.	-	-	-	-
	• Student proficiently troubleshoots interface issues and optimizes the sensor and wireless module integration with microcontrollers to enhance system performance and responsiveness	-	-	-	-
		100	60	20	20
NOS Total		**200**			

Annexure VIII: 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 IX: Acronym and Glossary

Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework

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.