

QUALIFICATION FILE

IoT Solution Engineer

- ☒ Short Term Training (STT) ☐ Long Term Training (LTT) ☐ Apprenticeship
☒ Upskilling ☐ Dual/Flexi Qualification ☐ For ToT
☒ For ToA

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

NCrF/NSQF Level: 6

Submitted By:

IT-ITes Sector Skills Council NASSCOM (SSC NASSCOM)

Plot No. – 7, 8, 9 & 10

Sector – 126, Noida, Uttar Pradesh - 201303

Table of Contents

Section 1: Basic Details	3
Section 2: Module Summary	6
NOS/s of Qualifications.....	6
Mandatory NOS/s:	6
Elective NOS/s:	7
Optional NOS/s:	8
Assessment - Minimum Qualifying Percentage.....	8
Section 3: Training Related.....	8
Section 4: Assessment Related.....	9
Section 5: Evidence of the Need for the Qualification	10
Section 6: Annexure & Supporting Documents Check List.....	10
Annexure: Evidence of Level	11
Annexure: Tools and Equipment (lab set-up).....	13
Annexure: Industry Validations Summary	14
Annexure: Training & Employment Details	16
Annexure: Detailed Assessment Criteria	16
Annexure: Assessment Strategy	21
Annexure: Acronym and Glossary	23

Section 1: Basic Details

1.	Qualification Name	IoT Solution Engineer	
2.	Sector/s	IT/ITeS	
3.	Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of the existing /previous qualification: QG-06-IT-01562-2023-V1.1-NASSCOM & Version 3	Qualification Name of the existing/previous version: IoT Solution Architect
4.	a. OEM Name b. Qualification Name (Wherever applicable)		
5.	National Qualification Register (NQR) Code &Version (Will be issued after NSQC approval)	QG-06-IT-045962025-V2-NASSCOM & Version 4	6. NCrf/NSQF Level: 6
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	The IoT Solution Architect role encompasses designing, maintaining, and securing end-to-end IoT solutions. They analyze business needs, select appropriate platforms, and develop system architectures that integrate hardware, software, and communication protocols. They plan for data flow, quality checks, security architecture, and system interoperability, often incorporating AI, edge computing, and cloud services. They evaluate existing architectures for performance, security, reliability, and scalability, ensuring continuous improvement. Additionally, they design hardware components, oversee integration of IT and OT systems, enforce standards compliance, and validate solution effectiveness through testing. Security is prioritized across all layers, with ongoing updates to safeguard against threats. Overall, the architect ensures solutions meet technical, operational, and business objectives effectively and securely.	
9.	Eligibility Criteria for Entry for a Student/Trainee/Learner/Employee	Entry Qualification & Relevant Experience: **Relevant Experience in job roles related to Computer Science/IT/IoT/ Solution architecture (AI/ML or software development). The relevant experience would include work, internship and apprenticeship after completing relevant educational qualifications.	

		* PHD or PG or UG or diploma with courses related to Engg./ Science <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>Completed 4 Year UG*</td><td>-</td></tr> <tr> <td>2</td><td>Completed 3-Year UG* Degree</td><td>1.5 years of relevant experience**</td></tr> <tr> <td>3</td><td>Previous Relevant qualification of NSQF level 5.5</td><td>1.5 years of relevant experience**</td></tr> </tbody> </table> Min Age: NA						S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	Completed 4 Year UG*	-	2	Completed 3-Year UG* Degree	1.5 years of relevant experience**	3	Previous Relevant qualification of NSQF level 5.5	1.5 years of relevant experience**				
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)																					
1	Completed 4 Year UG*	-																					
2	Completed 3-Year UG* Degree	1.5 years of relevant experience**																					
3	Previous Relevant qualification of NSQF level 5.5	1.5 years of relevant experience**																					
10.	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	20 Credits	11. Common Cost Norm Category (I/II/III) (wherever applicable): II																				
12.	Any Licensing Requirements for Undertaking Training on This Qualification (wherever applicable)	NA																					
13.	Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)	☐ Offline Only ☐ Online Only ☒ Blended																					
		<table border="1"> <thead> <tr> <th>Training Delivery Mode</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>174</td><td>306</td><td>120</td><td>-</td><td rowspan="2">600</td></tr> <tr> <td>Online</td><td>174</td><td>306</td><td>120</td><td>-</td></tr> </tbody> </table> (Refer Blended Learning Annexure for details)					Training Delivery Mode	Theory (Hours)	Practical (Hours)	OJT (Mandatory) Hours	OJT (Recommended) Hours	Total (Hours)	Classroom (offline)	174	306	120	-	600	Online	174	306	120	-
Training Delivery Mode	Theory (Hours)	Practical (Hours)	OJT (Mandatory) Hours	OJT (Recommended) Hours	Total (Hours)																		
Classroom (offline)	174	306	120	-	600																		
Online	174	306	120	-																			
14.	Aligned to NCO/ISCO Code/s (if no code is available mention the same)	NCO- 2015/NIL																					

15.	Progression Path After Attaining the Qualification, wherever applicable (Please show Professional and Academic progression)	This entry should refer to one or more of the following: Professional progression: access to related qualification(s) at the next NSQF level: Lead IoT Solution Architect, Lead IoT Product Manager, Lead IoT Network Specialist Academic progression: access to related qualification(s) at the next NSQF level: IoT Product Manager, IoT Network Specialist	
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 Amenable to Persons with Disability	☒ Yes ☐ No If "Yes", specify applicable type of Disability: Visual, Hearing or Speech impairment, Locomotor Disability	
19.	How will participation of women be encouraged?	The Program is gender neutral although to increase women's participation, organizations are keeping aside a few seats to encourage female candidates.	
20.	Are Greening/Environment Sustainability Aspects covered (Specify the NOS/Module which Covers it)	☒ Yes ☐ No , DGT/VSQ/N0102: Employability Skills (60 Hours)	
21.	Is Qualification suitable to be offered in Schools/Colleges	Schools: ☐ Yes ☒ No Colleges ☒ Yes ☐ No	
22.	Name and Contact Details Submitting / Awarding Body SPOC (In case of CS or MS, provide details of both Lead AB & Supporting ABs)	Name: Namrata Kapur Email: Standards@nasscom.in Contact No.: 0120-4990111 Website: https://www.sscnasscom.com/	
23.	Final Approval Date by NSQC: 07 th October 2025	24. Validity Duration: 3 Years	25. Next Review Date: 07 th October 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.	Design new solution architectures as per specifications for IoT	SSC/N8246, V1	Core	6	04	30:00	60:00	30:00	00:00	120:00	30	50	-	20	100	12
2.	Maintain existing architectures & continuously evaluate and upgrade the architecture of IoT solutions	SSC/N8247, V1	Core	6	04	30:00	60:00	30:00	00:00	120:00	30	50	-	20	100	12
3.	Design and implement security architecture across end-to-end IoT solutions	SSC/N8210, V3	Core	6	04	30:00	60:00	30:00	00:00	120:00	30	50	-	20	100	12
4.	Integrate Information Technology (IT) systems with Operational Technology (OT) systems	SSC/N8214, V3	Core	6	01	10:00	15:00	05:00	00:00	30:00	30	50	-	20	100	12

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/ Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
5.	Test and validate architecture of IoT solutions	SSC/N8215, V3	Core	6	02	20:00	30:00	10:00	00:00	60:00	30	50	-	20	100	12
6.	Use appropriate standards and ensure compliance of IoT solutions	SSC/N8217, V3	Core	6	01	10:00	15:00	05:00	00:00	30:00	30	50	-	20	100	12
7.	Integrate IoT solutions across various device components, networks, databases, analytics solutions and cloud infrastructure.	SSC/N8220, V3	Core	6	01	10:00	15:00	05:00	00:00	30:00	30	50	-	20	100	12
8.	Design hardware for IoT Solutions	SSC/N8248,V1	Core	6	01	10:00	15:00	05:00	00:00	30:00	30	50	-	20	100	12
9.	Employability Skills (60 Hours)	DGT/VSQ/0102, V1	Non-Core	4	02	24:00	36:00	00:00	00:00	60:00	20	30	-	-	50	04
Grand Total					20	174:00	306:00	120:00	00:00	600:00	260	430	-	160	850	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.																

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NS QF 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)
Duration (in Hours) / Total Marks																

Optional NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NS QF 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 PercentagePlease 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)	Educational Qualification: Graduate (Engineering/ Technology/ Computer Science) Industry & training experience: 2 years of industry experience in IoT. The industry experience would include work, internship, and apprenticeships undertaken after regular graduation. Certification: "Trainer" mapped to the Qualification Pack "MEP/Q2601" Minimum accepted score is 80% aggregate
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2.	Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Educational Qualification: Graduate (Engineering/ Technology/ Computer Science) Industry & training experience: 4 years of industry experience in IoT. The full-time experience would include work, internship, and apprenticeship undertaken after regular graduation. Certification: "Master Trainer" mapped to the Qualification Pack "MEP/Q2602" Minimum accepted score is 90% aggregate.
3.	Tools and Equipment Required for the 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)	Educational Qualification: Graduate (Engineering/ Technology/ Computer Science) Industry & Training Experience: 2 years of industry experience in IoT. The full-time experience would include work, internship, and apprenticeship undertaken after regular graduation. Certification: "Assessor" mapped to the Qualification Pack "MEP/Q2701" Minimum accepted score is 80% aggregate.
2.	Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines), (wherever applicable)	Educational Qualification: Graduate (Engineering/ Technology/ Computer Science) Industry & Training Experience: 2 years of industry experience IoT. The full-time experience would include work, internship, and apprenticeship undertaken after regular graduation. Certification: "Assessor" mapped to the Qualification Pack "MEP/Q2701" Minimum accepted score is 80% aggregate.
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Educational Qualification: Graduate (Engineering/ Technology/ Computer Science) Industry & Training Experience: 4 years of industry experience IoT. The full-time experience would include work, internship, and apprenticeship undertaken after regular graduation.

		Certification: "Lead Assessor" mapped to the Qualification Pack "MEP/Q2702" Minimum accepted score is 90% aggregate.
4.	Assessment Mode (<i>Specify the assessment mode</i>)	The assessment will consist of a blend of hands-on practical evaluations, viva-voce, and online proctored scenario-based multiple-choice questions ensuring a thorough evaluation of the individual's proficiency in learning outcomes, practical understanding, and real-world application of concepts.
5.	Tools and Equipment Required for Assessment	☒ Same as for training ☐ Yes ☐ No (<i>details to be provided in Annexure-if it is different for Assessment</i>)

Section 5: Evidence of the Need for Qualification

Provide Annexure/Supporting documents name.

1.	Latest Skill Gap study (not older than 2 years) (Yes/No):
2.	Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):
3.	Government/Industry initiatives/requirement (Yes/No):
4.	Number of industry validations provided: 15
5.	Estimated number of people to be trained and employed: 5000
6.	Evidence of Concurrence/Consultation with Line/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/NSQF descriptors (<i>Mandatory</i>)	Evidence of Level
2.	Annexure: List of tools and equipment relevant for NOS (<i>Mandatory, except in case of online course</i>)	Tools and Equipment (lab set-up)

3.	Annexure: Detailed Assessment criteria (<i>Mandatory</i>)	Performance Criteria Details
4.	Annexure: Assessment Strategy (<i>Mandatory</i>)	Assessment Strategy
5.	Annexure: Blended Learning (<i>Mandatory, in case selected Mode of delivery is Blended Learning</i>)	NA
6.	Annexure: Multiple Entry Exit Details (<i>Mandatory, in case qualification has multiple entry-exit</i>)	NA
7.	Annexure: Acronym and Glossary (<i>Optional</i>)	NA
8.	Supporting Document: Model Curriculum (<i>Mandatory-Public View</i>)	MC_SSC/Q8202_IoT Solution Engineer_V4.0
9.	Supporting Document: Career Progression (<i>Mandatory-Public View</i>)	NA
10.	Supporting Document: Occupational Map (<i>Mandatory</i>)	IT-ITeS Occupation Map
11.	Supporting Document: Assessment SOP (<i>Mandatory</i>)	Assessment Strategy
12.	Any Other document you wish to submit:	NA

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
Process	- select appropriate design standards, methods and tools - identify business requirements - define detailed component specifications design data feeds, data quality checks and components needed to configure the solution - develop technical capabilities roadmap for new solution architectures	The individual in this role needs to have a comprehensive understanding of the solution being developed by the organization. The individual should be able to use standard and non-standard processes to define the architecture of the solution including the components, data feeds and quality checks for the data.	6

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 knowledge	- knowledge of organizational policies, procedures and guidelines which relate to designing new solution architectures - knowledge of different platforms such as mobile application, mobile browser, web browser - knowledge of different governance issues and standards for data storage, security, - knowledge of privacy and monitoring mechanisms and architectures - knowledge of different quality metrics to monitor performance of architecture - knowledge of different trends and industry standards on new approaches to solution design - knowledge of technical features of the various components of a solution	The individual should have in-depth knowledge of the different types of business requirements from the solution and the various platforms on which the solution can be deployed.	6
Professional skill	- How to perform IT-OT integrations - Different security requirements of the solution and the organization - Different stages of the data lifecycle management process including data acquisition, backup, maintenance, usage and destruction - How to create visualizations - How to perform IT-OT integrations - Knowledge of the fundamental concepts of value engineering and how it supports effective solution development - Different standards for solution and architecture designs	The individual should also be able to write detailed component specifications for the solution and should understand how the components might evolve. They should also know how to write scripts to assess the data being used by the solution.	6
Core skill	- Evaluate changes in cross-border data governance issues, PII regulations, GDPR, security and monitoring standards - Undertake impact analysis on major design options - develop technical capabilities roadmap for new solution architectures	The individual in this role is responsible for overseeing any changes in solution architecture design based on internal and external factors. The individual should be able to undertake impact analysis on the major design options to identify the most suitable one. They should also	6

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
	- Identify data quality metrics and guide processes that track and measure data quality continually - Identify potential risks, and define mitigation plans and processes for appropriate people - How to scale the solution architecture - Analyse data and activities	understand how the solution architecture might need to be modified in the future based on evolutions in technology, changes in standards, exposure to risks or to improve the performance. Additionally, the individual needs to make plans to scale the solution to accommodate user growth.	
Responsibility	- Apply balanced judgments to different situations - Follow rule-based decision-making processes - Complete accurate well written work with attention to detail - Plan and organize your own work to achieve targets and deadlines - Make decisions on suitable courses - Convey relevant information to teams that implement solution architecture - Manage performance of teams and motivate them to their full potential	The role also requires the individual to work with and support teams that are responsible for the development deployment of the solution.	6

Annexure: Tools and Equipment (lab set-up)

Batch Size:

S. No.	Tool / Equipment Name	Specification	Quantity for the specified Batch size
1	PC/Laptop with internet	-	
2	IDE for Software Development	VS Code	
3	Diagramming and Design Tool	Draw.io	
4	ML Framework and libraries	Tensorflow,Pytorch,Scikit learn	
5	Cloud-based visualizations and model development	Google Colab	
6	Middleware for IoT system integration	Node-RED	
7	API testing tool	Postman	

8	Hardware prototyping and design	Fritzing	
9	Hardware development platform	Arduino IDE	
10	Open-source edge computing framework	Edge X Foundry	
11	IoT Platform & Cloud services	Eclipse IoT,AWS Free Tier	
12	Edge Computing and Containerization	Docker (containerization platform for deploying IoT applications) KubeEdge (edge computing framework for containerized applications) Wireshark (network monitoring and security analysis)	
13	Security Tools	OpenSSL	
14	Monitoring Tool	Prometheus	

*Tools are Open source

Classroom Aids

- Projector
- Mic
- Whiteboard Markers
- Board

Annexure: Industry Validations Summary

Provide summary information of all the industry validation in table.

S. No	Organisation Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile
1	Wipro	Narendra Nande	Director	-	9900086708	narendra.nande@wipro.com	https://www.linkedin.com/in/narendra-nande-84402a2/?originalSubdomain=in

2	Skillsda	Sankar Vijyan/Thiru R	Centre Manager/Head R&D	-	9894801793	sv@skillsda.com skillsda.com thiru@skillsda.com	https://www.linkedin.com/in/sankar-vijayan-73a33852/ https://www.linkedin.com/in/dr-thirukkumaran-raman-1435a1216/
3	Forbes	Naveenkumar Janakiraman	Data Research Analyst	-	9976773109	naveenkumarj4997@gmail.com	-
4	Sankey Solutions	Chandan Rajurohit	Solution lead	-	8369853182	Chandan.r1@sankeysolutions.com	-
5	Intellibren	Kailash PD	Director	-	6374700185	Kailash@intellibren.com	-
6	Mind share	Pamindar Singh	Team Lead	-	8713901984	paminder.singh@theminshare.in	https://www.linkedin.com/in/paminder-singh-7990b8101/
7	Amazon	Asvin Ragav R	Data Associate	-	9994308478	asvinragav16@gmail.com	-
8	Data Switch	Thilak hariharaSudhan A	Product Engineer	-	6393798750	thilakhariharan@gmail.com	https://www.linkedin.com/in/thilak-hariharasudhan-43a89b269/?originalSubdomain=in
9	Q Acadmey	Deepak Gour	Product and Academic Head	-	9893554394	deepak@qacademy.ca	https://ca.linkedin.com/in/deepak-gour-8853968
10	Frontier	Santhosh kumar S	DevOps Engineer L1	-	9655747400	santhoshselvaraj24031998@gmail.com	-
11	Kornferry	Ragul	Data analyst	-	9659964881	ragulblooper143@gmail.com	-
12	Tata consultancy services	Karthiga N	Test Analyst	-	7092257551	karthiga0115@gmail.com	-
13	Accenture	Sree Karthikeyan	Cybersecurity IAM Analyst	-	9626165768	sreekarthikeyan0898@gmail.com	https://www.linkedin.com/in/sree-karthikeyan-a88a84187/?originalSubdomain=in
14	IBM	Arpita Majumder	Tech Consultant	-	7894369677	Arpita.majumder@ibm.com	https://www.linkedin.com/in/arpita-majumder-85612a67/
15	RnD Soft	Tamilselvan	IT Support Manager	-	9361784871	dtamilselvan1004@gmail.com	

Annexure: Training & Employment Details

Training & Employment Projections:

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employed Opportunities	Estimated Training #	Estimated Employed Opportunities	Estimated Training #	Estimated Employed Opportunities
2023-24	1000		200	-	100	-
2024-25	2000		400	-	200	-
2025-26	2000		400	-	200	-

#The Estimated Data is an average for each state.

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

Qualification Version	Year	Total Candidates			Women			People with disability		
		Trained	Assessed	Certified	Trained	Assessed	Certified	Trained	Assessed	Certified
	2022-23	-	-	-	-	-	-	-	-	-

Content availability for the previous version of qualifications:

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

Language in which content is available:

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
SSC/N8246 Design IoT solution architectures as per specifications for IoT	PC1. Identify business requirements, analyze Business Objectives and User Needs	2	3	-	1
	PC2. Evaluate the platform on which the solution is to be built	2	3	-	2
	PC3. Design data feeds, data quality checks, and components needed to configure the solution	2	3	-	1
	PC4. Define & plan system-level architecture for the solution	2	3	-	1
	PC5. Select appropriate design standards, methods and tools	2	4	-	2
	PC6. Select Communication Protocols and Cloud Platforms	2	3	-	1
	PC7. Design Security Architecture	2	3	-	1
	PC8. Specify Hardware Components and Network Topology	1	3	-	1
	PC9. Develop Software and Data Processing Modules	3	3	-	1
	PC10. Plan Integration with Existing IT and OT Systems	3	4	-	2
	PC11. Conduct Testing and Validation	1	3	-	1
	PC12. Iterate and Refine the Design	1	3	-	1
	PC13. Prepare Deployment and Monitoring Strategies	3	3	-	2
	PC14. Implement Deployment and Maintenance Procedures	2	3	-	1
	PC15. Applicability of AI and Machine Learning for IoT Solutions	1	3	-	1
	PC16. Applicability of Edge Computing in IoT Architectures	1	3	-	1
	Total Marks	30	50	-	20
SSC/N8247 Maintain existing architectures & continuously evaluate and upgrade the architecture of IoT solutions	PC1.review existing system architecture designs to ensure balance of functional, service quality, and systems management requirements	2	4	-	2
	PC2. review existing system architecture designs to ensure selection of appropriate technology, efficient use of resources, and integration of multiple systems	2	4	-	2
	PC3. review technical capabilities roadmap for existing solution architectures	2	3	-	1
	PC4. monitor changes in solution design standards and update architecture	2	3	-	1
	PC5. update documentation on existing solution architectures for appropriate people	2	3	-	1
	PC6. assess IoT architecture to highlight their characteristics, strengths, and weaknesses	3	4	-	1
	PC7. evaluate performance based on the responsiveness of the architecture	2	3	-	1
	PC8. evaluate the reliability of the architecture based on its ability to keep operating over time	2	3	-	1
	PC9. evaluate the availability of the architecture based on the proportion of time the system is up and running	2	3	-	1
	PC10. evaluate the security of the architecture based on its ability to resist unauthorized attempts at usage	3	4	-	1
	PC11. evaluate the modifiability of architecture in terms of the speed and costs needed to make changes to it	2	4	-	2

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC12. evaluate the portability of the architecture based on its ability to run under different computing environments	2	4	-	2
	PC13. perform regular upgrades to IoT architecture	2	4	-	2
	PC14. ensure upgrades address increased scalability, reliability, and security demands	2	4	-	2
	Total Marks	30	50	-	20
SSC/N8210 Design and implement security architecture across end-to-end IoT solutions	PC1.acquire a deep understanding of all technology systems of the organization	8	10	-	3
	PC2. identify business and security requirements of the solution	3	6	-	2
	PC3.identify and adopt security standards and protocols appropriate for the solution	2	2	-	1
	PC4.plan, research, and design robust security architectures for the solution	2	2	-	1
	PC5.implement security architecture across all layers of the solution (such as the device, network, and cloud layers)	1	3	-	2
	PC6.adopt security safeguards such as routers, firewalls, and Identity Access Management tools	3	6	-	2
	PC7.protect the IoT network from unauthorized access or malicious intent	1	3	-	1
	PC8.ensure only authorized devices should be able to connect to the network	1	3	-	2
	PC9. test security architecture to ensure expected behaviour as per requirements	1	3	-	1
	PC10. design and implement security policies and standards	2	2	-	1
	PC11. ensure that solution architecture implements, operates, and controls prescribed security policies and standards	2	2	-	1
	PC12. ensure that security policies and standards are followed at all times	2	2	-	1
	PC13. ensure that solution architecture performs day-to-day security processes such as threat and vulnerability management	1	3	-	1
	PC14. continuously update and upgrade security systems as needed	1	3	-	1
	Total Marks	30	50	-	20
SSC/N8214 Integrate Information Technology (IT) systems with Operational Technology (OT) systems	PC1. identify defined areas where IT-OT integration can deliver tangible value	3	5	-	2
	PC2. identify and engage with stakeholders who will be involved in IT-OT integration	3	5	-	2
	PC3. define the scope of the IT-OT integration initiative	2	1	-	1
	PC4. assess costs and benefits of performing ITOT integration	2	1	-	1
	PC5. evaluate risks, consequences and pitfalls of performing IT-OT integration	3	5	-	2
	PC6. document the value of IT-OT integration including potential growth factors such as enabling new business models	2	3	-	1
	PC7. assess the need to consult external vendors to perform IT-OT integration	2	3	-	1
	PC8. obtain executive buy-in to perform IT-OT integration	3	5	-	2

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC9. evaluate and document current state across people, processes, and technology systems before the IT-OT integration	1	3	-	1
	PC10. evaluate and document future state across people, processes, and technology systems post-IT-OT integration	1	3	-	1
	PC11. perform IT-OT integration considering factors such as analysis of standards, data ownership, and security policies	3	5	-	2
	PC12. ensure that IT-OT integration does not interfere with daily or mission-critical tasks on both IT and OT systems	1	3	-	1
	PC13. perform quality testing for IT-OT integrations	1	3	-	1
	PC14. determine frequency to review and update integrated systems	2	2	-	1
	PC15. review and update integrated systems over regular intervals	1	3	-	1
	Total Marks	30	50	-	20
SSC/N8215 Test and validate architecture of IoT solutions	PC1. test usability of IoT architecture with real users	4	7	-	2
	PC2. test user's ease to use the application, flexibility in handling controls, and system's ability to meet its objectives	4	7	-	3
	PC3. test performance issues in the design of IoT architecture	4	7	-	3
	PC4. test multiple OS versions, browser types, generations of devices, communications nodes, etc. on IoT architecture	4	7	-	3
	PC5. perform regression testing to overcome upgrade related issues	4	7	-	3
	PC6. use virtualization tools and technologies to perform reliability and scalability testing	5	7	-	3
	PC7. build IoT test environments that involve simulation of edge devices	5	8	-	3
	Total Marks	30	50	-	20
SSC/N8217 Use appropriate standards and ensure compliance of IoT solutions	PC1. evaluate what value a given standard brings to IoT architecture	5	8	-	3
	PC2. evaluate risks of not using a particular standard for the architecture	5	8	-	3
	PC3. identify standards that best fit the needs of the architecture	5	8	-	3
	PC4. ensure solutions are compliant with industry, technological and organizational regulations	5	8	-	3
	PC5. understand risk and compliance requirements that must be followed and document them	5	9	-	4
	PC6. identify plan of action to proactively manage risks and offset costs of compliance	5	9	-	4
	Total Marks	30	50	-	20
SSC/N8220 Integrate IoT solutions across	PC1. identify the short-term and long-term integration needs of the solution	3	5	-	2
	PC2. implement integrations of services such as data integration, cloud service integration, business intelligence, etc. depending on needs of the solution	3	5	-	2

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
various device components, networks, databases, analytics solutions and cloud infrastructure.	PC3. create and coordinate roles, responsibilities, and delivery of integration needs across various teams, both internal and external	4	9	-	3
	PC4. perform integration across various solution components such as devices, networks, databases and cloud infrastructure	6	9	-	3
	PC5. manage architecture design, security architecture design and hardware design across all components of the solution during integration	3	5	-	2
	PC6. ensure reliability, scalability, availability of integrated architecture	3	5	-	2
	PC7. perform IoT standardization to streamline overall solution integration of IoT projects	3	5	-	2
	PC8. ensure that standardization enables interoperability across devices	3	5	-	2
	PC9. ensure that standardization leads to reduction in overall project costs	2	2	-	2
	Total Marks	30	50	-	20
SSC/N8248 Design hardware for IoT solutions	PC1. design and assemble all hardware solution components	5	7	-	2
	PC2. perform build vs buy analysis of hardware components (such as control systems, enclosures and actuators)	3	4	-	2
	PC3. develop designs for components to be built internally	4	6	-	2
	PC4. transfer designs to manufacturing teams and provide them with appropriate technical support	2	3	-	2
	PC5. perform hardware component selection for components to be procured externally	2	4	-	2
	PC6. liaise with multiple external hardware partners and evaluate partners based on required specifications	2	4	-	2
	PC7. create and maintain device catalogue	2	2	-	1
	PC8. ensure field readiness of devices and tolerance to environmental conditions	2	4	-	2
	PC9. ensure certification requirements are met for all hardware components used including flameproof / safety / regulatory requirements	2	4	-	2
	PC10. perform pre-compliance testing for hardware components	2	4	-	1
	PC11. implement security measures to protect against tampering, IP theft, reverse engineering attacks, etc	2	4	-	1
	PC12. ensure hardware security measures against Differential Power Analysis (DPA) attacks	2	4	-	1
	Total Marks	30	50	-	20
DGT/VSQ/ N0102 Employability Skills (60 Hrs)	PC1. Introduction to Employability Skills	1	1	-	-
	PC2. Constitutional values – Citizenship	1	1	-	-
	PC3. Becoming a Professional in the 21st Century	2	4	-	-
	PC4. Basic English Skills	2	3	-	-
	PC5. Career Development & Goal Setting	1	2	-	-

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC6. Communication Skills	2	2	-	-
	PC7. Diversity & Inclusion	1	2	-	-
	PC8. Financial and Legal Literacy	2	3	-	-
	PC9. Essential Digital Skills	3	4	-	-
	PC10. Entrepreneurship	2	3	-	-
	PC11. Customer Service	1	2	-	-
	PC12. Getting Ready for Apprenticeship & Jobs	2	3	-	-
	Total Marks	20	30	-	-
Grand Total Marks		260	430	-	160

Annexure: Assessment Strategy

Assessment Process Overview

Batch Creation & Assessment Request:

Training Providers (TP) or Training Centers (TC), including any other authorized partner of Ministry/ Department create batches / push batches on the SIDH portal. Assessment requests are submitted through the SIDH portal or via email or other media as authorized from time to time. For NON-SIDH schemes, assessment requests are received electronically or through respective State Skill Mission portals. TP/TC initiates the assessment request through the InSDMS portal and processes the payment (where applicable).

Batch Alignment & Confirmation:

Upon payment confirmation, batches are assigned to the Assessment Agency based on factors like:

- Assessment readiness
- Availability of certified assessors for the specific job role
- Assessment capping to an assessment agency as prescribed from time to time for an AB An email communication / prescribed mode communication is sent to TP/TC for confirmation of the assessment date, with IT-ITeS SSC in the loop. Once confirmation is received, the Assessment Agency designates a TOA-certified assessor to conduct or facilitate the assessment.
- Batches are only formed when the Qualification is active.

Candidate Verification & Assessment Execution:

Candidate details are verified and documented at the beginning of the assessment by a certified assessor. A Quality Assurance (QA) mechanism is enforced, requiring an undertaking from the TC. Regular feedback is collected from TP/TC to ensure continuous improvement.

Evidence Collection & Validation:

Proctors or assessors capture date/time-stamped and geo-tagged photographs of the assessment location during the process. Attendance is also ensured offline. A PC-wise result analysis is conducted to refine assessment standards.

Monitoring & Compliance:

Batch monitoring follows established protocols, ensuring adherence to assessment guidelines. Sample based surprise visits are conducted at TC locations during both training and assessments to verify compliance. This structured approach ensures transparency, quality control, and validation throughout the assessment process.

Testing Environment:

- Check the Assessment location, date and time
- If the batch size is more than 30, then there should be 2 Assessors.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.

Assessment Quality Assurance levels/Framework:

IT-ITeS SSC nasscom is responsible for the development and periodic review of the question bank developed for a specific job role. We publish an openly accessible sample /model question paper on our website for all stakeholders. The quality of the Question Bank created by the assessment designer is validated by a Subject matter experts on the following parameters:

- Appropriateness of the Question Bank in terms of facts, data and information.

- Checks for grammar, spellings, scripting and formatting.
- The information provided should be specific enough to remove any ambiguity in answers/solutions to the question.
- Relevance – Assessing the topic well w.r.t. the job role.
- Check if the difficulty level of each question is as per the matrix.
- Check if the images used in the question are clear and relevant.
- All variables, symbols and abbreviations used must be declared.
- The correct answer option should be unique, and the options should not be overlapping

Annexure: 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
OJT	On 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 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 about 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 based on their main economic function, product, service, or technology.