

QUALIFICATION FILE

Blockchain Full Stack Developer

- ☒ 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: 5

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: 7

 Assessment - Minimum Qualifying Percentage..... 7

Section 3: Training Related..... 8

Section 4: Assessment Related..... 8

Section 5: Evidence of the Need for the Qualification 9

Section 6: Annexure & Supporting Documents Check List..... 10

 Annexure: Evidence of Level 11

 Annexure: Tools and Equipment (lab set-up)..... 12

 Annexure: Industry Validations Summary 13

 Annexure: Training & Employment Details 16

 Annexure: Blended Learning 17

 Annexure: Detailed Assessment Criteria 17

 Annexure: Assessment Strategy 21

 Annexure: Acronym and Glossary 23

Section 1: Basic Details

1.	Qualification Name	Blockchain full stack developer							
2.	Sector/s	IT/ITeS							
3.	Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of the existing /previous qualification: QG-05-IT-01845-2024-V1.1-NASSCOM & Version 2	Qualification Name of the existing/previous version: Core Blockchain developer						
4.	a. OEM Name b. Qualification Name (Wherever applicable)	Blockchain full-stack developer							
5.	National Qualification Register (NQR) Code &Version (Will be issued after NSQC approval)	QG-05-IT-04331-2025-V2-NASSCOM & V3	6. NCrF/NSQF Level: 5						
7.	Award (Certificate/Diploma/Advance Diploma/ Any Other (Wherever applicable specify multiple entry/exits also & provide details in annexure)	Certificate							
8.	Brief Description of the Qualification	Individuals at this job are responsible for developing the core blockchain. They will be responsible for developing tools, processes, and mechanisms for defining and developing the core blockchain. They will be responsible for defining and documenting technical specifications pertaining to the blockchain solution, including client, consensus algorithm, distributed data management, ledger maintenance, participant incentivization, smart contract/ chain code, and tokenomics.							
9.	Eligibility Criteria for Entry for a Student/Trainee/Learner/Employee	Entry Qualification & Relevant Experience: **Relevant experience in job roles related to Blockchain/Computer Science/IT The relevant experience would include work, internship and apprenticeship undertaken post-completion of relevant educational qualifications. *PG/UG/Degree/Diploma in (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 2nd year of 3-year/ 4-year UG*</td> <td>-</td> </tr> </tbody> </table>		S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	Completed 2 nd year of 3-year/ 4-year UG*	-
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)							
1	Completed 2 nd year of 3-year/ 4-year UG*	-							

		2	Completed 3Y UG Diploma* after 10 th	3 Years of relevant experience**																			
		3	Previous Relevant qualification of NSQF level 4	1.5 years of relevant experience**																			
10.	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	17 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>183</td><td>237</td><td>90</td><td>-</td><td>510</td></tr> <tr> <td>Online</td><td>183</td><td>237</td><td>90</td><td>-</td><td>510</td></tr> </tbody> </table>				Training Delivery Mode	Theory (Hours)	Practical (Hours)	OJT (Mandatory) Hours	OJT (Recommended) Hours	Total (Hours)	Classroom (offline)	183	237	90	-	510	Online	183	237	90	-	510
Training Delivery Mode	Theory (Hours)	Practical (Hours)	OJT (Mandatory) Hours	OJT (Recommended) Hours	Total (Hours)																		
Classroom (offline)	183	237	90	-	510																		
Online	183	237	90	-	510																		
		(Refer Blended Learning Annexure for details)																					
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: Blockchain Architect																					
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, NOS: 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: 8 th May 2025	24. Validity Duration: 3 Years	25. Next Review Date: 8 th May 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 training **Man.**-Mandatory Training **Rec.**-Recommended **Proj.**- Project

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/ Non-Core	NCrF/N SQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT- Man.	OJT- Rec.	Total	Th.	Pr.	Proj.	Viv a	Total	Weightage (%) (if applicable)
1.	Set up development environment for blockchain solution development	SSC/N8738, V1.0	Core	5	03	24:00	48:00	18:00	00:00	90:00	30	50	0	20	100	18
2.	Develop backend services and frontend interfaces for the dApp, integrating all components.	SSC/N8739, V1.0	Core	5	05	50:00	82:00	18:00	00:00	150:00	30	50	0	20	100	18
3.	Conduct comprehensive testing of the blockchain solution	SSC/N8740, V1.0	Core	5	03	39:00	33:00	18:00	00:00	90:00	30	50	0	20	100	18
4.	Monitor the performance of blockchain applications and networks.	SSC/N8741, V1.0	Core	5	02	26:00	16:00	18:00	00:00	60:00	30	50	0	20	100	18
5.	Provide support in resolving issues related to blockchain apps.	SSC/N8728, V3.0	Core	5	02	20:00	22:00	18:00	00:00	60:00	30	50	0	20	100	18
6.	Employability Skills (60 Hour)	DGT/VSQ/N010 2, V1	Non-Core	4	02	24:00	36:00	00:00	00:00	60:00	20	30	0	0	50	10
Duration (in Hours) / Total Marks			-	-	17	183:00	237:00	90:00	00:00	510:00	170	280	-	100	550	100

Elective NOS/s:

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1.																
2.																
Duration (in Hours) / Total Marks																

Optional NOS/s:**Optional Module: Blockchain Infrastructure**

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/Non-Core	NCrF/NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1.																
2.																
Duration (in Hours) / Total Marks																

Assessment - Minimum Qualifying Percentage**Assessment - Minimum Qualifying Percentage**

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.)

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 blockchain The industry experience would include work, internship, and apprenticeship undertaken after regular graduation Certification: "Trainer" mapped to the Qualification Pack "MEP/Q2601" Minimum accepted score is 80% aggregate
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 blockchain. 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 Blockchain. 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 in Blockchain. 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 in Blockchain . 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 (Specify the assessment mode)	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 (details to be provided in Annexure-if it is different for Assessment)

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): NA
2.	Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): NA
3.	Government/Industry initiatives/requirement (Yes/No): NA
4.	Number of industry validations provided: 21
5.	Estimated number of people to be trained and employed: NA
6.	Evidence of Concurrence/Consultation with Line/State Departments: Awaited

	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/Q8703_Blockchain Full Stack Developer_V3.0
9.	Supporting Document: Career Progression <i>(Mandatory-Public View)</i>	NA
10.	Supporting Document: Occupational Map <i>(Mandatory)</i>	Blockchain 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	- Refine and map the functional and non-functional requirements of the customer/organization to technical specifications. - Develop blockchain network for the solution. - Determine the token model to be used in the blockchain solution. - Establish programming/coding standards for developing and maintaining the core blockchain system. - Collect data on existing IT systems/ infrastructure in the organization. - Define infrastructure components and third-party services to meet infrastructure requirements.	The individual in this role must work in a constantly changing environment where he/she collaborates with internal and external stakeholders to develop continuous integration and delivery mechanisms. To perform his/her role effectively, the individual needs to combine a knowledge of the processes used within the organization and the tools used across the industry and develop mechanisms accordingly.	5
Professional knowledge	- Mapping of functional and non-functional requirements - Consensus protocols in blockchain technology - Knowledge of Data Jurisdictions - Concepts of blockchain technology such as nodes, proof of work, smart contracts, fork, cryptographic primitives, etc. - Data storage methods and tools - Concepts of blockchain security such as cryptography, keys, signatures, etc.	The individual in the role must have a vast amount of knowledge regarding various tools used for DevOps processes. These include tools for configuration management, continuous integration, automation, and testing. He/she needs to have deep theoretical knowledge of these processes.	5
Professional skills	- Update the technical specifications based on changes in business requirements. - Build tooling to enable blockchain functions such as query or sign transactions	The role demands that the individual has acquired practical skills to develop tools and mechanisms for design and development. The individual needs the analytical ability to apply these skills effectively to generate optimal solutions.	5
Core skill	- Define service configurations for deployment of the blockchain solution. - Define security controls for the network.	The individual must possess in-depth knowledge of the technological trends, products and methodologies used both within the organization and outside it. He/she must understand larger business, technological and regulatory	5

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
	- Define quality assurance standards for the deployment of the blockchain solution - Evaluate characteristics of existing assets by collaborating with different stakeholders	trends and stay updated on the latest developments. This would enable him/her to develop the mechanisms in line with existing industry practices.	
Responsibility	- Encourage teams to set goals aligned to the vision and objectives of the organization. - Express confidence on the team's ability to accomplish certain tasks. - Encourage team members with diverse viewpoints to express their concerns. - Create realistic schedules for projects and direct your efforts in implementing it as per the plan. - Ask for clarification and advice from appropriate people. - Identify the larger business and organizational context behind the requirements of the stakeholder - Check that your own and/or your peers' work meets customer requirements - Plan and organize your own work to achieve targets and deadlines - Work with colleagues to deliver shared goals	The role demands working in a team to develop core blockchain solutions. This may involve helping peers with their work from time to time and providing feedback and advice to help improve the quality of their work. Since this role is likely to have people reporting to it, the individual performing this role is supposed to take responsibility for the output and the development of the entire team.	5

Annexure: Tools and Equipment (lab set-up)

Batch Size:

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	PC/Laptops	NA	1 Unit per Trainee
2	High Speed Internet Connection	NA	1 Unit per Trainee
3	Projector or Large Display	NA	1 Unit Per Classroom

4	White Board	NA	1 Unit Per Classroom
5	Programming Languages	Solidity	To be installed on each PC/Laptop
6	Blockchain Platform	Ethereum	For each PC/Laptop/User ID
7	Development Environment	Remix IDE	For each PC/Laptop/User ID
8	Version Control	Git	For each PC/Laptop/User ID
9	Front end and Back-end Development	React.js & Node.js	For each PC/Laptop/User ID
10	Testing tool	Mocha	For each PC/Laptop/User ID
11	Documentation Tools	MS Word, Google Docs	For each PC/Laptop/User ID

Annexure: Industry Validations Summary

Provide summary information of all the industry validation in table.

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile (if available)
1	Wipro	Deepesh Gandhi	Head,Blockchain Delivery,Digital Transformation & Innovations at Wipro Limited	-	7066037907	deepesh.gandhi@wipro.com	https://www.linkedin.com/in/deepesh-gandhi-733ab54/
2	Q Acadmey	Deepak Gour	Product and Academic Head	-	9893554394	deepak@qacademy.ca	https://ca.linkedin.com/in/deepak-gour-8853968
3	IBM	Arpita Majumder	Tech Consultant	-	7894369677	Arpita.majumder@ibm.com	https://www.linkedin.com/in/arpita-majumder-85612a67/
4	iAccept Softwares Pvt Ltd	B Mohan Kumar	Founder, iaccept software	-	9845208784	mohan@iaccept.in	https://www.linkedin.com/in/bmohankumar/
5	Data Switch	Thilak hariharasudhan A	Product Engineer	Data Switch, Chennai	6393798750	thilakhariharan@gmail.com	https://www.linkedin.com/in/thilak-hariharasudhan-43a89b269/

6	Delta Electronics India	Kabilan R D	Project Manager	-	7010811080	kabilanrdurai@outlook.com	https://www.linkedin.com/in/kabilan-r-d-b09856122/
7	Draup	MD Mahabub Alam	Architect-Technology	-	9731517171	mahabubalam@draup.com	https://www.linkedin.com/in/mdmahabubalam/?originalSubdomain=in
8	Forbes Advisor	Naveenkumar Janakiraman	Data Research Analyst	-	9976773109	naveenkumarj4997@gmail.com	https://www.linkedin.com/posts/naveenkumar-janakiraman_mvpp-dataresearch-forbesadvisor-activity-7128643208279969792-9ZyZ/
9	Accolite Digital	Ayushmaan Pandey	Senior Software Engineer	-	8077386365	ayushmaan.pandey@accolitedigital.com	https://www.linkedin.com/in/ayushmaanpandey
10	Intellibren	Kailash PD	Director, Technology	-	6374700185	kailash@intellibren.com	
11	Kornferry	Ragul Kumar	Data analyst	Kornferry, 1st Floor, Prestige Nebula, National Informatics Centre, II, Infantry Rd, Bangalore , Karnataka ,	9659964881	ragulbopper143@gmail.com	https://www.linkedin.com/in/ragul-kumar-b2297a171/
12	Mindshare (Inclusive Minds)	Pamindar Singh	Team Lead	-	8713901984	paminder.singh@theminds-hare.in	https://www.linkedin.com/in/paminder-singh-7990b8101/
13	Engagely	Aniruthan.V	Senior software engineer	207-1208, Damji Shamji Business Gallaria, Kanjurmar	8098978284	Aniruthan.v@engagely.ai	https://www.linkedin.com/in/aniruthan-venkatavaradhan-79849b203/

				g West, Mumbai, Maharash tra 400078			
14	Quantrello Digital Pvt. Ltd	Ayon Hazra	Founder & CEO	Kolkata Biotech Park, EN 24, Sector V, Salt Lake City, Kolkata 700091, India	89105 60570	info@bwslabs.com	https://www.linkedin.com/in/ayonhazra/
15	Synergy Software Systems	Aravind Raj	Functional Consultant	-	+971 555782899	aravindrajjayachandran@gmail.com	https://www.linkedin.com/in/aravind-raj-17554071/
16	Infosys	Vivek Pilaniya	Program Manager	Infosys, delhi	9718423687	vivek.pilania@infosys.com	https://www.linkedin.com/in/vivekpilania-iimc/?originalSubdomain=in
17	Barq	Satheesh	Senior Decision Scientist	Barq, 2163 Al Urubah Rd, Northern Maathar District 7795, Riyadh 12334, Kingdom of Saudi Arabia	9444218513	satheeshk.sekar@gmail.com	
18	Bluevine	Krishn Gopal Rajput	Sr. Business operation analyst	-	9555863231	krishn.rajput@bluevine.com	https://www.linkedin.com/in/krishn-gopal-rajput-44a30611a/

19	Kwalee	Ravi Chaudhary	Software Engineering consultant	-	8750108744	ravi.chaudhary@kwalee.co m	https://www.linkedin.com/in/ravi-xo/
20	Capegemini	Anuapm Srivastava	Sr. Director, Digital Transformation	-	-	srivanupamk@gmail.com	https://www.linkedin.com/in/anupamksrivastava/
21	Skillsda	Dr. R Thirukumar Kottaram Ramesh	Head R&D Director-Engg.	-	9500123029	thiru@skillsda.com ram@skillsda.com	https://www.linkedin.com/in/kottaram-v-ramesh/ https://in.linkedin.com/in/dr-thirukkumaran-raman-1435a1216

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
2024-25	500	-	-	-	-	-
2025-26	500	-	-	-	-	-
2026-27	500	-	-	-	-	-

#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
		-	-	-	-	-	-	-	-	-

List Schemes in which the previous version of Qualification was implemented:

- 1.
- 2.

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: Blended Learning

Blended Learning Estimated Ratio & Recommended Tools:

Refer NCVET “Guidelines for Blended Learning for Vocational Education, Training & Skilling” available on:

<https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf>

S. No.	Select the Components of the Qualification	List Recommended Tools – for all Selected Components	Offline : Online Ratio
1	☐ Theory/ Lectures - Imparting theoretical and conceptual knowledge	NA	NA
2	☐ Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	NA	NA
3	☐ Showing Practical Demonstrations to the learners	NA	NA
4	☐ Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	NA	NA
5	☐ Tutorials/ Assignments/ Drill/ Practice	NA	NA
6	☐ Proctored Monitoring/ Assessment/ Evaluation/ Examinations	NA	NA
7	☐ On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	NA	NA

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/N8738 Set up development environment for blockchain solution development	PC1.Install Node.js and npm (Node Package Manager), these are essential for most blockchain development tools.	8	10	-	4
	PC2.Choose an Integrated Development Environment (IDE) for example Visual Studio Code with Solidity extensions	6	10	-	4
	PC3. Install Framework (for example truffle framework for Ethereum)	7	10	-	4
	PC4. Set up a local blockchain for development and testing	5	10	-	4
	PC5. Install browser extension for wallets (eg metamask) to interact with the blockchain networks	4	10	-	4
	Total Marks	30	50	-	20
SSC/N8739 Develop backend services and frontend interfaces for the dApp, integrating all components	PC1. Define the dApp's requirements and features	1	1	-	0.5
	PC2. Choose the blockchain platform (e.g., Ethereum, Binance Smart Chain)	1	2	-	0.5
	PC3. Design the system architecture	2	2	-	1
	PC4. Plan the data flow between components	2	2	-	1
	PC5. Develop Smart contracts	6	8	-	1
	PC6. Set up a Node.js server (e.g., Express.js, Nest.js) for backend development	1	2	-	1
	PC7. Implement RESTful API endpoints	1	2	-	1
	PC8. Integrate Web3.js or Ethers.js for blockchain interactions	1	2	-	1
	PC9. Set up a database (e.g., MongoDB, PostgreSQL)	1	2	-	1
	PC10. Implement data synchronization between blockchain and database	1	2	-	1
	PC11. Develop authentication and authorization mechanisms	1	2	-	1
	PC12.Set up a React.js project (e.g., Create React App, Next.js) for front end development	1	2	-	1
	PC13.Design and implement UI components	1	2	-	1
	PC14.Integrate Web3.js or Ethers.js for client-side blockchain interactions	1	2	-	1
	PC15. Implement state management (e.g., Redux, Context API)	1	2	-	1
	PC16. Create forms for user input and transaction submission	1	2	-	1
	PC17. Develop pages for displaying blockchain data and transaction history	1	2	-	1
	PC18. Develop comprehensive unit tests for smart contracts	2	2	-	1
	PC19. Implement end-to-end testing strategies for dApps	2	3	-	1
	PC20. Integrate smart contracts, backend services, and frontend interfaces	1	3	-	1
	PC21. Deploy dApps to test networks and prepare for deployment	1	3	-	1
	Total Marks	30	50	-	20

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
SSC/N8740 Conduct comprehensive testing of the blockchain solution	PC1. Establish clear objectives for testing, such as verifying functionality, ensuring security, and assessing performance under various conditions.	3	5	-	1
	PC2. Gather requirements from stakeholders to understand what needs to be tested, including specific functionalities and performance metrics.	3	5	-	1
	PC3. Create detailed test cases covering all aspects of the application based on functional requirements.	3	5	-	1
	PC4. Prepare a suitable testing environment that mimics production conditions as closely as possible	3	4	-	1
	PC5. Check if the tests can be automated to improve efficiency and coverage.	2	4	-	1
	PC6. Conduct functional testing to check transaction processing, smart contract execution, and adherence to consensus mechanisms.	2	4	-	1
	PC7. Conduct integration testing to ensure that different components of the blockchain application (e.g., smart contracts, APIs) interact correctly.	2	4	-	2
	PC8. Conduct performance testing to Assess the speed and efficiency of the blockchain network	2	4	-	2
	PC9. Conduct security testing to identify vulnerabilities within the blockchain application.	2	3	-	2
	PC10. Conduct Smart contracts testing to look for logical errors, proper execution paths, and potential security issues like reentrancy attacks or overflow errors	2	3	-	2
	PC11. Conduct API testing to ensure that the APIs used for integrating with other software functions correctly and securely	2	3	-	2
	PC12. Record outcomes of each test case, including any failures or issues encountered.	2	3	-	2
	PC13. Review results to identify patterns or recurring issues that need addressing.	2	3	-	2
	Total Marks	30	50	-	20
SSC/N8741 Monitor the performance of blockchain applications and networks	PC1. Select the appropriate consensus mechanism for optimising transaction speed and energy consumption	2	2	-	1
	PC2. Alleviate congestion on the main blockchain, by applying layer 2 solutions such as the Lightning Network etc. to be processed off-chain	2	2	-	1
	PC3. Partition the blockchain into smaller segments (shards), enabling parallel processing of transactions	2	2	-	1
	PC4. Ensure that nodes use solid-state drives (SSDs) for faster data access compared to traditional hard disk drives (HDDs)	2	2	-	1
	PC5. Use CPUs with high clock speeds for better single-threaded performance, as blockchain nodes often benefit from fast processing capabilities rather than a high number of core	2	2	-	1
	PC6. Optimize peer-to-peer (P2P) network topology to enhance communication between nodes	2	5	-	1
	PC7. Implement selective verification strategies in consensus protocols to reduce communication overhead and improve transaction validation efficiency	2	5	-	2

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC8. Conduct performance testing using tools like Hyperledger Caliper to measure key metrics such as throughput and latency under various conditions	2	5	-	2
	PC9. Use simulations to evaluate how changes in network configuration affect performance metrics, allowing for informed decisions regarding optimization strategies	2	5	-	2
	PC10. Assess the resource utilization (CPU, memory, disk I/O) of blockchain nodes	3	5	-	2
	PC11. Configure node exporters for collecting performance metrics & develop node performance dashboards	3	5	-	2
	PC12. Optimize smart contracts for gas efficiency	3	5	-	2
	PC13. Implement monitoring tools to continuously track performance metrics, enabling proactive adjustments based on real-time data.	3	5	-	2
	Total Marks	30	50	-	20
SSC/N8728 Provide support in resolving issues related to blockchain apps	PC1. Define a plan for providing support, including third party services and internal resource allocation	8	10	-	3
	PC2. Identify, analyze, and resolve complex technical issues within the blockchain ecosystem, providing timely support to maintain the stability and functionality	6	12	-	3
	PC3. Determine the type of support required based on the application (Debugging, Scalability, Security enhancement, interoperability, I/CD etc.)	6	8	-	3
	PC4. Define the incident Management and Support Processes	4	7	-	3
	PC5. Develop Continuous improvement and maintenance processes (analyzing user feedback, updated documentation, app optimization ec.)	4	9	-	4
	PC6. Handle active support for blockchain end-users	2	4	-	4
	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	-	-
	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	-	-

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC12 Getting Ready for Apprenticeship & Jobs	2	3	-	-
	Total Marks	20	30	-	0
Grand Total Marks		170	280	-	100

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.