



QUALIFICATION FILE

AI Data Engineering Analyst

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

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Section 1: Basic Details

1.	Qualification Name	AI Data Engineering Analyst	
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-01527-2023-V1.1-NASSCOM & Version 3	Qualification Name of the existing/previous version: AI Data Engineering Analyst
4.	a. OEM Name b. Qualification Name (Wherever applicable)		
5.	National Qualification Register (NQR) Code &Version (Will be issued after NSQC approval)	QG-05-IT-045812025-V2-NASSCOM & Version 4	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	Data Engineering analyst is responsible for designing, implementing, and maintaining the infrastructure that supports the collection, storage, processing, and analysis of data. They develop and manage data pipelines for extracting, transforming, and loading (ETL) data from various sources while ensuring data quality, accuracy, and security. Key responsibilities include collaborating with stakeholders to identify data needs, managing databases (e.g., MySQL, PostgreSQL), implementing validation and monitoring processes, and utilizing tools like Apache Airflow and Tableau for data management and visualization. Data engineers also enforce data governance and compliance with regulations while continuously improving data processes based on performance metrics and user feedback. Essential skills include proficiency in programming (especially Python and SQL), knowledge of data modeling and database design, and familiarity with cloud platforms and data security practices.	
9.	Eligibility Criteria for Entry for a Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience: **Relevant Experience in job roles related to IT/AI/Big Data Analytics/Programming The relevant experience would include work, internship, and apprenticeship after completing relevant educational qualifications.	

		* PG/UG/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 UG Diploma*</td><td>-</td></tr> <tr> <td>2</td><td>Completed 3Y Diploma* after 10th</td><td>1.5 Years of relevant experience**</td></tr> <tr> <td>3</td><td>Previous Relevant qualification of NSQF level 4.5</td><td>1.5 years of relevant experience**</td></tr> </tbody> </table> b. Age: NA						S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	Completed UG Diploma*	-	2	Completed 3Y Diploma* after 10 th	1.5 Years of relevant experience**	3	Previous Relevant qualification of NSQF level 4.5	1.5 years of relevant experience**				
S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)																					
1	Completed UG Diploma*	-																					
2	Completed 3Y Diploma* after 10 th	1.5 Years of relevant experience**																					
3	Previous Relevant qualification of NSQF level 4.5	1.5 years of relevant experience**																					
10.	Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))	16 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>160</td><td>230</td><td>90</td><td>-</td><td rowspan="2">480</td></tr> <tr> <td>Online</td><td>160</td><td>230</td><td>90</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)	160	230	90	-	480	Online	160	230	90	-
Training Delivery Mode	Theory (Hours)	Practical (Hours)	OJT (Mandatory) Hours	OJT (Recommended) Hours	Total (Hours)																		
Classroom (offline)	160	230	90	-	480																		
Online	160	230	90	-																			
14.	Aligned to NCO/ISCO Code/s (if no code is available mention the same)	NCO-2015/2521.0100																					
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: • Academic Progression: Access to other qualifications at the same NSQF level – Machine Learning Engineer • Professional Progression: Access to related qualification(s) at the next NSQF level – AI-Data Architect, AI- Solutions 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 participation of women will be encouraged?	The Program is gender neutral although to increase the women participation, organizations are keeping aside few seats to encourage the 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 training** **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.	Understand Database Management and Architecture	SSC/N8154, V1.0	Core	5	04	46:00	44:00	30:00	00:00	120:00	30	50	-	20	100	30
2.	Collect data and conduct data integration to develop a data pipeline	SSC/N8112 V3.0	Core	5	05	45:00	75:00	30:00	00:00	150:00	30	50	-	20	100	30
3.	Ensure data quality and data governance processes and structures are in place	SSC/N8119 V3.0	Core	5	05	45:00	75:00	30:00	00:00	150:00	30	50	-	20	100	30
4.	Employability Skill (60 Hrs)	DGT/VSQ/N0102 V1.0	Non-Core	4	02	24:00	36:00	00:00	00:00	60:00	20	30	-	-	50	10

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)
Duration (in Hours) / Total Marks					16	160:00	230:00	90:00	00:00	480:00	110	180	-	60	350	100

Elective NOS/s:

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

Optional NOS/s:

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

Assessment - Minimum Qualifying Percentage

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) <i>(as per NCVET guidelines)</i>	Educational Qualification: Graduate (Engineering/ Technology/ Computer Science) Industry & training experience: 2 years of industry experience in AIBDA. 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) <i>(as per NCVET guidelines)</i>	Educational Qualification: Graduate (Engineering/ Technology/ Computer Science) Industry & training experience: 4 years of industry experience in AIBDA. 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 <i>(If "Yes", details to be provided in Annexure)</i>
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) <i>(as per NCVET guidelines)</i>	Educational Qualification: Graduate (Engineering/ Technology/ Computer Science)
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		Industry & Training Experience: 2 years of industry experience in AIBDA. 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 AIBDA. 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 AIBDA. 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): Yes
2.	Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): Yes
3.	Government/Industry initiatives/requirement (Yes/No): Industry Initiative
4.	Number of industry validations provided: 21

5.	Estimated number of people to be trained and employed: 1300
6.	Evidence of Concurrence/Consultation with Line/State Departments: Applied 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>	Acronym and Glossary
8.	Supporting Document: Model Curriculum <i>(Mandatory-Public View)</i>	MC_SSCQ8106_AI Data Engineering Analyst_V4
9.	Supporting Document: Career Progression <i>(Mandatory-Public View)</i>	AI BDA Occupational Map
10.	Supporting Document: Occupational Map <i>(Mandatory)</i>	AI BDA Occupational Map
11.	Supporting Document: Assessment SOP <i>(Mandatory)</i>	-
12.	Any Other document you wish to submit:	

Annexure: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/NSQF Level
Professional Theoretical Knowledge/Process	- Develop, test and troubleshoot data pipelines - Evaluate feasibility and level of effort to integrate data - Partition or size the data as appropriate - Determine the right data format to be used and transform data into other formats - Combine tools into either macro or micro data pipelines	The individual in this role must work in a constantly changing environment where he/she needs to actively engage with other stakeholders including Data Architects and Data Scientists. To perform his/her role effectively, the individual requires a vast understanding of the procedural knowledge, guidelines, rules and service level agreements. He/she needs to adapt to changing circumstances while working within the organization's processes and guidelines.	5
Professional and Technical Skills/ Expertise/ Professional Knowledge	- Knowledge of organizational policies, procedures and guidelines which relate to designing and documenting data integrations - Knowledge of different approaches for testing and troubleshooting data pipelines - Knowledge of different methodological approaches for populating data warehouses - Knowledge of different performance criteria for data integrations - Knowledge of different data sources, data integration processes and techniques	The individual in the role must have a vast amount of knowledge across organizational policies, data warehouses, data integrations and data pipelines. Since this is a role that requires the application of knowledge across different changing scenarios, deep and vast knowledge is a necessity.	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
	Knowledge of different tools for developing data integrations such as Hive, Storm, Kafka		
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	- Use data integration processes to populate and refresh the data warehouse - Develop mechanisms for error and fault handling, and system availability for the data lake - Define performance criteria for the data integrations and optimize the data integrations based on the defined performance criteria - Query and write scripts to acquire and understand the data - Work on various operating systems such as linux, ubuntu, or windows - Apply problem-solving approaches in different situations - Apply balanced judgments to different situations	The role demands a skillset that allows the individual to create effective data architecture and integration solutions. To do so, the individual needs to have prior experience in a related field and must have the analytical ability to put these skills in practice.	5
Broad Learning Outcomes/Core Skill	- Good logical and mathematical skill understanding of social political and natural environment and organising information, communication and presentation - Evaluate different data warehouse, lake or pipeline designs - Design and implement ETL (Extract-Transform-Load) processes	The individual should possess in depth knowledge of the tools required to use data warehouses, data pipelines and ETL operations. Apart from the ability to use these tools, the individual needs to have a clear picture of the appropriate integrations that need to be achieved. To do so, he/she must have a strong understanding of different business and technological trends	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
	• Create documentation on developed data integrations for appropriate people • Validate data integrations with appropriate people • Apply different ETL (Extract-Transform-Load) concepts • Load data, metadata and other required categories into the data lake • different mechanisms for management of data lakes including error and fault handling, system availability, • duplication control, status updates		
Responsibility	• Listen effectively and orally communicate information accurately with attention to details • Check your work is complete and free from errors • Make decisions on suitable courses of action • Apply balanced judgements to different situations • Ask for clarification and advice from appropriate people • Build and maintain positive and effective relationships with clients • Check that your own and/or your peers'	The role demands working in a team to deliver consistent and accurate data integrations. 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

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
	work meets customer requirements - Plan and organize your own work to achieve targets and deadlines - Work with colleagues to deliver shared goals		

Annexure: Tools and Equipment (lab set-up)

List of Tools and Equipment

Batch Size:

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	PC/Laptop with internet	-	
2	Database Management Systems (DBMS)	MySQL, PostgreSQL	
3	ETL Tools	Informatica PowerCenter, Talend Open Studio, Apache Kafka ,Apache Airflow (also used for orchestration)	
4	Data Profiling tools	Pandas Profiling, DataGrip	
5	Scripting tools	Python (preferred for ETL scripting and data processing)	
6	ERD Modelling tools	Lucidchart, draw.io	
7	Dashboarding/Visualization Tools	Tableau ,Grafana	
8	Version control tool	Git (for managing code and scripts)	
9	API Interaction Tools/Libraries	Libraries such as Requests (for Python) or Postman (for testing APIs)	
10	Security and Access Control	Access Control Management Software Data Masking Tools/Libraries Security Auditing Tools (Nessus,OpenVAS etc.)	

- Tools are open source

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. White Board
2. White Board Marker
3. Projector

Annexure: Industry Validations Summary

Provide summary information of all the industry validation in table. This is not required for OEM Qualifications.

S. No	Organisation Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile
1	Infosys	Vivek Pilaniya	Program Manager	Infosys, delhi	9718423 687	vivek.pilania@infosys.com	https://www.linkedin.com/in/vivek-pilania-iimc
2	IBM	Arpita Majumder	Tech Consultant	IBM DLF Park 1	7894369 677	Arpita.majumder@ibm.com	https://www.linkedin.com/in/arpita-majumder-85612a67/
3	Mindshare (Inclusive Minds)	Pamindar Singh	Team Lead		8713901 984	paminder.singh@themindshare.in	https://www.linkedin.com/in/paminder-singh-7990b8101/
4	Freelance SME (Ex-3i Infotech)	Rishi Agrawal	Ex-SVP and Global Delivery Head – Automations, Applications and Analytics	-	7702191 049	agrishi@gmail.com	https://www.linkedin.com/in/agris-hi/
5	Acolyte	Saranya	Research Analyst		9944313 170	saranyakathir128@gmail.com	
6	Verizon	Sudeesh Sankaravel	Fellow Data Scientist	-	9176433 113	sudeesh.sankaravel@verizon.com	https://www.linkedin.com/in/sudeesh-sankaravel
7	Amazon	Asvin Ragav R	Data Associate		9994308 478	asvinragav16@gmail.com	
8	Sutherland	Nausath Raja	Sr. Director-Platform Solutions Group	-	9940113 955	naushathraja.mohammed@sutherlandglobal.com	https://www.linkedin.com/in/naushath-raj-mohammed-4b7080b6/

9	Forbes Advisor	Naveenkumar Janakiraman	Data Research Analyst		9976773109	naveenkumarj4997@gmail.com	https://www.linkedin.com/in/naveenkumar-janakiraman
10	Frontier	Santhosh kumar S	DevOps L1		9655747400	santhoshselvaraj24031998@gmail.com	
11	Accolite Digital	Ayushmaan Pandey	Senior Software Engineer	-	8077386365	ayushmaan.pandey@accolitedigital.com	https://www.linkedin.com/in/ayushmaanpandey
12	Impekable	sreepathi.D	Lead Market Research and Business Development		9655036999	sanjeevsree22@gmail.com	
13	Data Switch	Thilak hariharaSudhan A	Product Engineer	DataSwitch, Chennai	6393798750	thilakhariharan@gmail.com	https://www.linkedin.com/in/thilak-hariharasudhan-43a89b269/
14	Kornferry	Ragul	Data analyst	-	9659964881	ragulbloop143@gmail.com	https://www.linkedin.com/in/ragul-kumar-b2297a171/
15	Navitas life sciences Chennai	Gowtham K V	Junior Research associate	-	9994594693	gg17165322@gmail.com	
16	Intellibren	Kailash PD	Director	Intellibren services LLP	6374700185	kailash@intellibren.com	-
17	Openweaver	Ashok Balasubramanian	Founder & CEO	-	9962548366	ashok@openweaver.com	https://www.linkedin.com/in/ashok-balasubramanian/
18	Upgrad	Samneesh Sharma	Sr Manager-project delivery		8679334000	shamneesh.sharma@upgrad.com	https://www.linkedin.com/in/shamneeshsharma1987/
19	Q Acadmey	Deepak Gour	Product and Academic Head	-	9893554394	deepak@qacademy.ca	https://ca.linkedin.com/in/deepak-gour-8853968
20	Tata consultancy services	Karthiga N	Test Analyst	-	7092257551	karthiga0115@gmail.com	
21	Wipro	Narendra Nande	Practice Director (VLSI,SW and PSV Practice)	-	9900086708	narendra.nande@wipro.com	https://www.linkedin.com/in/narendra-nande-84402a2/

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	200		40		20	
2024-25	400		80		40	
2025-26	700		140		70	

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

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

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

Applicable for revised qualifications only, data to be provided year-wise for the next 3 years.

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

1.

Content availability for 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/ Candidate 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/N8154 Understand Database Management and architecture	PC1. Collaborate with stakeholders such as data analysts developers and business units to understand data needs usage patterns and performance expectations	3	5	-	2
	PC2. Identify specific use cases that the database must support such as reporting analytics or real time data processing and design a logical data model including entities relationships and attributes	3	5	-	2
	PC3. Determine the appropriate type of database based on data nature and transform the logical model into physical schema	3	5	-	2
	PC4. Install and configure the database management system as per organizational requirements and implement the physical schema	3	5	-	2
	PC5. Develop ETL processes to migrate existing data maintaining data integrity and populate the database	3	5	-	2
	PC6. Optimize query performance using indexing and query refinement and adjust database settings based on workload needs	3	5	-	2
	PC7. Establish role based access controls to secure sensitive data and develop recovery strategies to ensure business continuity	3	5	-	2

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC8. Conduct routine maintenance plan for horizontal or vertical scaling strategies to accommodate future needs	3	5	-	2
	PC9. Implement data integrity constraints to ensure data accuracy and perform periodic audits to detect anomalies maintaining data quality and consistency	3	5	-	2
	PC10. Document the database architecture including schema diagrams data models and configurations for future reference	3	5	-	2
	Total Marks	30	50	-	20
SSC/N8112: Collect data and conduct data integration to develop data pipeline	PC1. Identify relevant data sources such as databases APIs and files and assess their quality and format	3	5	-	2
	PC2. Create a plan for collecting transforming and loading data into the target platform choosing methods like batch or real-time processing	3	5	-	2
	PC3. Use scripts or tools to extract data from sources ensuring efficiency and compliance with source restrictions	3	5	-	2
	PC4. Clean and preprocess data to ensure consistency remove duplicates handle missing values and perform necessary transformations	3	5	-	2
	PC5. Load data into the target platform while maintaining system performance and validating data accuracy and completeness	3	5	-	2
	PC6. Set up monitoring to detect data issues and document workflows for future reference and collaboration	3	5	-	2
	PC7. Continuously monitor and improve the data pipeline based on performance and stakeholder feedback	3	5	-	2
	PC8. Work with stakeholders to understand data needs and design the pipeline architecture using appropriate tools and technologies	3	5	-	2
	PC9. Develop extraction and transformation modules with error handling and optimize load strategies for downstream processes	3	5	-	2
	PC10. Automate workflows with orchestration tools and implement monitoring for reliable and scalable data pipeline operations	3	5	-	2
	Total Marks	30	50	-	20
SSC/N8119: Ensure data quality and data governance processes and	PC1. Work with stakeholders to identify data quality criteria like accuracy and completeness and document benchmarks to measure quality	3	5	-	2
	PC2. Analyze data to understand its characteristics and create processes to clean duplicates and fix formatting errors	3	5	-	2
	PC3. Standardize data formats such as dates and text and set validation rules to ensure data is correct and consistent	3	5	-	2

NOS/Module Name	Assessment Criteria for Performance Criteria/Learning Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
structures are in place	PC4. Use scripts to automatically check data during ETL processes detect errors and set up alerts for issues	3	5	-	2
	PC5. Improve data quality by adding external data sources while ensuring accuracy and standard practices are followed	3	5	-	2
	PC6. Investigate the causes of data issues and set up ongoing monitoring with reports and dashboards to track quality trends	3	5	-	2
	PC7. Collect feedback from data users about quality issues and update processes and documentation regularly	3	5	-	2
	PC8. Create regular data quality reports for stakeholders and stay current with best practices and tools in data quality management	3	5	-	2
	PC9. Establish a data governance framework with roles and policies to manage data classification access and responsibilities	3	5	-	2
	PC10. Implement security measures like encryption and access controls and review logs to ensure compliance and respond to incidents	3	5	-	2
	Total Marks	30	50	-	20
DGT/VSQ/N0102 Employability Skills for (60 Hours)	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	-	-
	PC12. Getting Ready for Apprenticeship & Jobs	2	3	-	-
	Total Marks	20	30	-	-
Grand Total		110	180	-	60

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 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 based on their main economic function, product, service or technology.

Annexure: Market Research & Gap Analysis

While Data Scientists create algorithms, it is the responsibility of the Data Engineer to put algorithms into production for use by business. Data Engineers harness data and analytics, execute the investment plans of Data Architects, enable analytics and data science and adopt and activate data governance policies. Companies are therefore hiring Data Engineers to accelerate data science, ensure data lake adoption, activating data and analytics in systems and processes, and creating consistency to reduce data risk.

<https://go.forrester.com/blogs/data-engineers-will-be-more-important-than-data-scientists/>

Currently, only 15% of Big Data projects go into production. Companies are therefore starting to hire more Data Engineers to reduce this gap. A recommended figure is to have 2 – 5 Data Engineers for every Data Scientist. Going by the rate at which Data Scientists are being hired by companies, it is expected the rate at which Data Engineers will be hired will also increase correspondingly.

<https://www.oreilly.com/ideas/data-engineers-vs-data-scientists>

The demand for Data Engineers is currently unable to match the supply for it. It is estimated that for every unfilled Data Scientist opening, there are twelve unfilled Data Engineer job openings. Clearly, there is an urgent need to upskill people to become Data Engineers.

<https://www.eckerson.com/articles/data-engineering-coming-of-age>

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