



## QUALIFICATION FILE

### Chemical Laboratory Technology

Short Term Training (STT)  Long Term Training (LTT)  Apprenticeship  
 Upskilling  Dual/Flexi Qualification  For ToT  For ToA  For IndiaSkills and World Skills Competition  
 General  Multi-skill (MS)  Cross Sectoral (CS)  Future Skills  OEM

NCrF/NSQF Level: 4.5

Submitted By:

Life Sciences Sector Skill Development Council

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## Section 1: Basic Details

1.	<b>Qualification Name</b>	Chemical Laboratory Technology	
2.	<b>Sector/s</b>	Life Sciences	
3.	<b>Type of Qualification:</b> <input checked="" type="checkbox"/> New <input type="checkbox"/> Revised <input type="checkbox"/> Has Electives/Options <input type="checkbox"/> OEM	<b>NQR Code &amp; version of existing/previous qualification:</b> NA	<b>Qualification Name of existing/previous version:</b> NA
4.	a. OEM Name b. Qualification Name (Wherever applicable)	NA	
5.	<b>National Qualification Register (NQR) Code &amp;Version</b>	QG-4.5-LS-01815-2024-V1-LSSC	<b>6. NCrF/NSQF Level:</b> 4.5
7.	<b>Award (Certificate/Diploma/Advance Diploma/ Any Other (Wherever applicable specify multiple entry/exists also &amp; provide details in annexure)</b>	Certificate	
8.	<b>Brief Description of the Qualification</b>	<p>The work of laboratory chemical analyst is the basis of product quality in many industries. Chemical analysis is necessary to control the compliance of the properties of raw materials, intermediate stages of the technological process, and finished products with current standards.</p> <p>The laboratory chemical analyst performs laboratory analyses, tests, measurements aimed at determining</p> <ul style="list-style-type: none"> <li>• The qualitative chemical composition of a substance</li> <li>• The quantitative ratio of chemical elements and compounds within them</li> <li>• Processing of the obtained data,</li> <li>• Reporting results of analyses and</li> <li>• Other types of laboratory work</li> </ul> <p>according with the requirements of standards and specifications. The scope and complexity of the tests performed depend on the type of tasks set by the employer</p>	
9.	<b>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</b>	<p><b>a. Entry Qualification &amp; Relevant Experience:</b> As per the India skill /world Skill Guidelines</p>	
10.	<b>Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</b>	17	<b>11. Common Cost Norm Category (I/II/III) :</b> I
12.	<b>Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)</b>	NA	

<b>13. Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</b>	<input checked="" type="checkbox"/> Offline <input type="checkbox"/> Online <input type="checkbox"/> Blended <table border="1" data-bbox="950 163 2050 346"> <thead> <tr> <th data-bbox="950 163 1208 242">Training Delivery Modes</th> <th data-bbox="1208 163 1376 242">Theory (Hours)</th> <th data-bbox="1376 163 1545 242">Practical (Hours)</th> <th data-bbox="1545 163 1713 242">OJT Mandatory (Hours)</th> <th data-bbox="1713 163 1882 242">OJT Recommended (Hours)</th> <th data-bbox="1882 163 2050 242">Total (Hours)</th> </tr> </thead> <tbody> <tr> <td data-bbox="950 242 1208 306">Classroom (offline)</td> <td data-bbox="1208 242 1376 306">200</td> <td data-bbox="1376 242 1545 306">310</td> <td data-bbox="1545 242 1713 306">00</td> <td data-bbox="1713 242 1882 306">00</td> <td data-bbox="1882 242 2050 306">510</td> </tr> <tr> <td data-bbox="950 306 1208 346">Online</td> <td data-bbox="1208 306 1376 346"></td> <td data-bbox="1376 306 1545 346"></td> <td data-bbox="1545 306 1713 346"></td> <td data-bbox="1713 306 1882 346"></td> <td data-bbox="1882 306 2050 346"></td> </tr> </tbody> </table>						Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)	Classroom (offline)	200	310	00	00	510	Online					
Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)																			
Classroom (offline)	200	310	00	00	510																			
Online																								
<b>14. Aligned to NCO/ISCO Code/s (if no code is available mention the same)</b>	NCO-2015/2113.0500																							
<b>15. Progression path after attaining the qualification (Please show Professional and Academic progression)</b>	NA																							
<b>16. Other Indian languages in which the Qualification &amp; Model Curriculum are being submitted</b>	English and Hindi																							
<b>17. Is similar Qualification(s) available on NQR-if yes, justification for this qualification</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No URLs of similar Qualifications:																							
<b>18. Is the Job Role Amenable to Persons with Disability</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																							
<b>19. How Participation of Women will be Encouraged</b>	<p>Policy measures are needed to promote the inclusion of educated and working women, especially in Science and technology fields, where only 14% of women are hired among micro, small, and medium enterprises despite comprising 43% of Science and technology graduates. The conscious efforts are made by LSSSDC to sensitize organizations and hiring manager for bring Women employees on board by LSSSDC through Industry Associations and Large MNCs on governing Board and have received positive responses and assurance from most of employers in life sciences sector to bring Min. 30% share of Women employees and apprentices in the given occupation and job role. LSSSDC shall also be driving a Diversity and Inclusivity Program with Indian Pharmaceutical Alliance for catalyzing the efforts.</p>																							
<b>20. Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																							
<b>21. Is Qualification Suitable to be Offered in Schools/Colleges</b>	<input type="checkbox"/> Schools <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Colleges <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																							
<b>22. Name and Contact Details of Submitting / Awarding Body SPOC (In case of CS or MS, provide details of both Lead AB &amp; Supporting ABs)</b>	<b>Name:</b> Mrs. Shivi Chaudhary <b>Email:</b> shivi.chaudhary@lsssdcc.in <b>Contact No.:</b> +91 11 41042407/ 408, +91 9315747189 <b>Website:</b> <a href="https://www.lsssdcc.in/">https://www.lsssdcc.in/</a>																							
<b>23. Final Approval Date by NSQC: 06/02/2024</b>	<b>24. Validity Duration: 2 years</b> The validity of these qualifications shall be only for two years or as per the WorldSkills competition cycle,	<b>25. Next Review Date: 06/02/2026</b>																						

		whichever is earlier". (Please refer clause 4.1. (d) of NCVET Order No. 32001/06/2023/NCVET, dated 26.01.2024)	
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Msoc Approved

## 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/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.	Work organization and management	LFS/N0354	Non-Core	4.5	1.0	15	15	00	00	30	30	70	-	-	100	10%
2.	Communication and interpersonal skills	LFS/N0355	Non-Core	4.5	1.0	15	15	00	00	30	30	70	-	-	100	10%
3.	Techniques, procedures, and methods	LFS/N0356	Core	4.5	7.0	70	140	00	00	210	30	70	-	-	100	35%
4.	Data processing and record keeping	LFS/N0357	Core	4.5	2.0	30	30	00	00	60	30	70	-	-	100	10%
5.	Analysis, interpretation, and evaluation	LFS/N0358	Core	4.5	4.0	40	80	00	00	120	30	70	-	-	100	15%
6.	Problem solving through the application of scientific methods	LFS/N0359	Core	4.5	1.0	15	15	00	00	30	30	70	-	-	100	10%
7.	Trends in applied Chemistry	LFS/N0360	Core	4.5	1.0	15	15	00	00	30	30	70	-	-	100	10%
<b>Duration (in Hours) / Total Marks</b>					17.0	200	310	00	00	510	210	490	-	-	700	100%

## Assessment - Minimum Qualifying Percentage

*Please 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:** 70 % (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.	<b>Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)</b>	<p>B.Pharma /UG in relevant field / B.Tech in (Relevant Field) with 7 years of industry relevant experience in Chemical Laboratory Technology and 2 year experience On the job assessment/ Training experience/ Vocational assessment/ Academic assessment</p> <p>Or</p> <p>M. Sc./M. Tech/M. Pharma (with relevant Subjects) with 5 years of industry relevant experience in Chemical Laboratory Technology and 2-year experience on the job assessment/ Training experience/ Vocational assessment/ Academic assessment</p> <p>Certified for Job role: "Chemical Laboratory Technology" mapped to Job Role: "LFS/Q0314, v1" with minimum accepted score of 80%.</p> <p>Recommended that the Trainer is certified for the Job Role: "Trainer (VET and SKILLS)", mapped to the Qualification Pack: "MEP/2601 ver 2.0 " with minimum score of 80%</p>
2.	<b>Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)</b>	<p>B.Pharma / UG in relevant field / B.Tech in (Relevant Field) with 10 years of industry relevant experience in Chemical Laboratory Technology and 4 year experience On the job assessment/ Training experience/ Vocational assessment/ Academic assessment</p> <p>Or</p> <p>M. Sc./M. Tech/M. Pharma (with relevant Subjects) with 8 years of industry relevant experience in Chemical Laboratory Technology and 3 year experience on the job assessment/Training experience/Vocational assessment/ Academic assessment</p> <p>Certified for Job role: "Chemical Laboratory Technology" mapped to Job Role: "LFS/Q0314, v1" with minimum accepted score of 80%.</p> <p>Recommended that the Trainer is certified for the Job Role: " Master Trainer (VET and SKILLS)", mapped to the Qualification Pack: "MEP/2602 ver 2.0 " with minimum score of 80%.</p>
3.	<b>Tools and Equipment Required for Training</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>(If "Yes", details to be provided in Annexure)</i>

4.	<b>In Case of Revised Qualification, Details of Any Upskilling Required for Trainer</b>	
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## Section 4: Assessment Related

1.	<b>Assessor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)</b>	<p>B.Pharma / UG in relevant field / B.Tech in (Relevant Field) with 10 years of industry relevant experience in Chemical Laboratory Technology and 2 year experience On the job assessment/ Training experience/ Vocational assessment/ Academic assessment</p> <p>Or</p> <p>M. Sc./M. Tech/M. Pharma (with relevant Subjects) with 10 years of industry relevant experience in Chemical Laboratory Technology and 2-year experience on the job assessment/ Training experience/ Vocational assessment/ Academic assessment</p> <p>Certified for Job role: "Chemical Laboratory Technology" mapped to Job Role: "LFS/Q0314, v1" with minimum accepted score of 80%.</p> <p>Recommended that the Assessor is certified for the Job Role: "Assessor (VET and SKILLS)", mapped to the Micro credentials: "MEP/Q2701 ver 2.0" with minimum score of 80%.</p>
2.	<b>Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)</b>	<p>B.Pharma / UG in relevant field / B.Tech in (Relevant Field) with 7 years of industry relevant experience in Chemical Laboratory Technology and 2 year experience On the job assessment/ Training experience/ Vocational assessment/ Academic assessment</p> <p>Or</p> <p>M. Sc./M. Tech/M. Pharma (with relevant Subjects) with 5 years of industry relevant experience in Chemical Laboratory Technology and 2-year experience on the job assessment/ Training experience/ Vocational assessment/ Academic assessment</p> <p>Certified for Job role: "Chemical Laboratory Technology" mapped to Job Role: "LFS/Q0314, v1" with minimum accepted score of 80%.</p>
3.	<b>Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)</b>	<p>B.Pharma / UG in relevant field / B.Tech in (Relevant Field) with 10 years of industry relevant experience in Chemical Laboratory Technology and 4 year experience On the job assessment/ Training experience/ Vocational assessment/ Academic assessment</p> <p>Or</p> <p>M. Sc./M. Tech/M. Pharma (with relevant Subjects) with 10 years of industry relevant experience in Chemical Laboratory Technology and 3 year experience on the job assessment/Training experience/Vocational assessment/ Academic assessment</p>

	<p>Certified for Job role: "Chemical Laboratory Technology" mapped to Job Role: "LFS/Q0314, v1" with minimum accepted score of 80%.</p> <p>Recommended that the Assessor is certified for the Job Role: "Lead Assessor (VET and SKILLS)", mapped to the Micro credentials: "MEP/Q2702 ver 2.0" with minimum score of 80%.</p>
4.	<b>Assessment Mode</b> (Specify the assessment mode)  Mode: <input type="checkbox"/> Online Only <input type="checkbox"/> Offline Only <input checked="" type="checkbox"/> Blended
5.	<b>Tools and Equipment Required for Assessment</b>  <input checked="" type="checkbox"/> Same as for training <input type="checkbox"/> Yes <input type="checkbox"/> No (details to be provided in Annexure-if it is different for Assessment)

## Section 5: Evidence of the need for the Qualification

Provide Annexure/Supporting documents name.

1.	<b>Latest Skill Gap Study (not older than 2 years) (Yes/No):</b> No
2.	<b>Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):</b> No
3.	<b>Government /Industry initiatives/ requirement (Yes/No):</b> Yes for India Skills and World skills competition
4.	<b>Number of Industry validation provided:</b> NA
5.	<b>Estimated nos. of persons to be trained and employed:</b> This qualification shall be used in IndiaSkills Competition 2023-24 so number of candidates trained and employes is not estimated at this stage.
6.	<b>Evidence of Concurrence/Consultation with Line Ministry/State Departments:</b> No If "No", why: This is a standards adopted from World Skills for India Skills competition

## Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	<b>Annexure:</b> NCrF/NSQF level justification based on NCrF level/NSQF descriptors (Mandatory)	YES
2.	<b>Annexure:</b> List of tools and equipment relevant for qualification (Mandatory, except in case of online course)	YES
3.	<b>Annexure:</b> Detailed Assessment Criteria (Mandatory)	YES
4.	<b>Annexure:</b> Assessment Strategy (Mandatory)	YES
5.	<b>Annexure:</b> Blended Learning (Mandatory, in case selected Mode of delivery is "Blended Learning")	NA

6.	<b>Annexure:</b> Multiple Entry-Exit Details ( <i>Mandatory, in case qualification has multiple Entry-Exit</i> )	NA
7.	<b>Annexure:</b> Acronym and Glossary ( <i>Optional</i> )	YES
8.	<b>Supporting Document:</b> Model Curriculum ( <i>Mandatory – Public view</i> )	YES
9.	<b>Supporting Document:</b> Career Progression ( <i>Mandatory - Public view</i> )	YES
10.	<b>Supporting Document:</b> Occupational Map ( <i>Mandatory</i> )	YES
11.	<b>Supporting Document:</b> Assessment SOP ( <i>Mandatory</i> )	
12.	<b>Any other document you wish to submit:</b>	

### 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	<p>Few Professional Theoretical Knowledge required to be acquired by Chemical Laboratory Technician are:</p> <ul style="list-style-type: none"> <li>• Work organization and management</li> <li>• Communication and interpersonal skills</li> <li>• Techniques, procedures, and methods</li> <li>• Data processing and record keeping</li> <li>• Analysis, interpretation, and evaluation</li> <li>• Problem solving through the application of scientific methods</li> <li>• Trends in applied Chemistry</li> </ul>	<p>Chemical Laboratory Technician perform various task required for analysis of various natural and synthetic materials, to perform qualitative and quantitative tests using modern chemical, bioanalytical and physicochemical analytical methods. They should be able to act logically and systematically, complying with sanitary and hygienic requirements and occupational safety and health standards. He/She also generates the critical records for every activity performed in compliance with data integrity rules. He/she also analyzes and report of chemical related issues to the senior for solving work related problems</p>	Level- 4.5
Professional and Technical Skills/ Expertise/ Professional Knowledge	<p>Few of the job elements, expected to be performed by Chemical Laboratory Technician are:</p> <ul style="list-style-type: none"> <li>• Work organization and management</li> <li>• Communication and interpersonal skills</li> <li>• Techniques, procedures, and methods</li> <li>• Data processing and record keeping</li> </ul>	<p>Chemical Laboratory Technician perform various task required for analysis of various natural and synthetic materials, to perform qualitative and quantitative tests using modern chemical, bioanalytical and physicochemical analytical methods. They should be able to act logically and systematically, complying with sanitary and hygienic requirements and occupational safety and health standards. He/she should have knowledge of procedures for documentation, reporting, and escalation of incidents and</p>	Level- 4.5

	<ul style="list-style-type: none"> <li>• Analysis, interpretation, and evaluation</li> <li>• Problem solving through the application of scientific methods</li> <li>• Trends in applied Chemistry</li> </ul>	<p>deviations. He/she should have knowledge of procedure for generating both electronic and manual records. He/she should follow procedures and protocols for the environment, health and safety as per regulatory guidelines</p>	
<b>Employment Readiness &amp; Entrepreneurship Skills &amp; Mind-set/Professional Skill</b>	<p>Few of the job elements, expected to be performed by Chemical Laboratory Technician are:</p> <ul style="list-style-type: none"> <li>• Work organization and management</li> <li>• Communication and interpersonal skills</li> <li>• Techniques, procedures, and methods</li> <li>• Data processing and record keeping</li> <li>• Analysis, interpretation, and evaluation</li> <li>• Problem solving through the application of scientific methods</li> <li>• Trends in applied Chemistry</li> </ul>	<p>Job holder utilizes professional skills like good communication and interpersonal skills, good analytical skills, reasoning skills, attention to details, critical thinking, problem solving and excellent organizational skills to perform tasks of Chemical Laboratory Technician. He/she uses the planning and organizing skills to perform day to day tasks of laboratory analysis. He/she demonstrates technical proficiency in operating and maintaining instruments and equipment used in laboratory analysis. He/she possesses effective communication skills to collaborate with supervisor and team and convey information clearly</p>	Level- 4.5
<b>Broad Learning Outcomes/Core Skill</b>	<p>Few of the job elements, expected to be performed by Chemical Laboratory Technician are:</p> <ul style="list-style-type: none"> <li>• Work organization and management</li> <li>• Communication and interpersonal skills</li> <li>• Techniques, procedures, and methods</li> <li>• Data processing and record keeping</li> <li>• Analysis, interpretation, and evaluation</li> <li>• Problem solving through the application of scientific methods</li> <li>• Trends in applied Chemistry</li> </ul>	<p>Chemical Laboratory Technician uses planning and organizing skills to perform day to day tasks of Laboratory Analysis. He/she uses analytical and critical thinking skills for reporting and documentation of all significant activities, incidents and deviations as per recording formats in compliance with SOP and regulatory guideline. He/she uses adaptability, flexibility and problem solving skills to coordinate with colleagues/supervisor and teammates. He/she ensures compliance to organizational SOPs and regulatory requirements. He/she possesses basic computer skills for data entry, equipment monitoring and using various software used in Laboratory operations.</p>	Level- 4.5
<b>Responsibility</b>	<p>Few of the job elements, expected to be performed by Chemical Laboratory Technician are:</p>	<p>Chemical Laboratory Technician has responsibility for his/her work and learning and supports to Junior QA Chemist and cross functional Teams. And in case of a scenario/situation of</p>	Level- 4.5

	<ul style="list-style-type: none"> <li>• Work organization and management</li> <li>• Communication and interpersonal skills</li> <li>• Techniques, procedures, and methods</li> <li>• Data processing and record keeping</li> <li>• Analysis, interpretation, and evaluation</li> <li>• Problem solving through the application of scientific methods</li> <li>• Trends in applied Chemistry</li> </ul>	no clear choice, he is expected to take guidance from the Head of Quality Department.	
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### Annexure: Tools and Equipment (Lab Set-Up)

#### List of Tools and Equipment

Batch Size: Min 1

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	2,6-dichloroindophenol	50g	50g
2	Acetylsalicylic acid (ASS)	10g	10g
3	Analytical balance		4 pcs per Skill
4	Antivibration table for balance		6 pcs per Skill
5	Ascorbic acid	50g	50g
6	associated software to analyze results with computer	as required	2
7	beaker	100 ml	10
8	beaker	250 ml	20
9	beaker (dry)	50 ml	10
10	Beaker, low form, with spout (100 ml)		50 pcs per Skill
11	Beaker, low form, with spout (1000 ml)		10 pcs per Skill
12	Beaker, low form, with spout (250 ml)		3 pcs per Competitor
13	Beaker, low form, with spout (50 ml)		100 pcs per Skill
14	Beaker, low form, with spout (600 ml)		20 pcs per Skill
15	boiling water	as required	
16	Bulb pipette, 1 mark, capacity 1 cm <sup>3</sup>		2 pcs per Competitor

17	Bulb pipette, 1 mark, capacity 10 cm <sup>3</sup>		4 pcs per Competitor
18	Bulb pipette, 1 mark, capacity 100 cm <sup>3</sup>		1 pcs per Competitor
19	Bulb pipette, 1 mark, capacity 2 cm <sup>3</sup>		2 pcs per Competitor
20	Bulb pipette, 1 mark, capacity 25 cm <sup>3</sup>		2 pcs per Competitor
21	Bulb pipette, 1 mark, capacity 5 cm <sup>3</sup>		4 pcs per Competitor
22	Bulb pipette, 1 mark, capacity 50 cm <sup>3</sup>		1 pcs per Competitor
23	Burette Stand with a metal clamp		
24	Cabinet		10 pcs per Skill
25	Caffeine standard ,	500 mg/l	2L
26	Carousel Stand for 6 pipettes		3 pcs per Skill
27	carrier gas lines	as required	1
28	Chemstation , openlab / MassHUNTER for agilent	software	
29	clamp holder	metal	5
30	clamp stand	metal	5
31	Clothes hanger		3 pcs per Skill
32	Color Laser Printer + Scan (A3)		2 pcs per Skill
33	column - HP5MS, DB624 and consumable (septa , syringes)	as required	2
34	Computer		1 pcs per Competitor Plus 2 Pcs additional for SCM Room
35	Condenser with ground glass joint (Allinh)		2 pcs per Competitor
36	Copper sulfate solution ,	6.90%	5L
37	Cuvettes	quartz	3
38	DESICCATOR		10 pcs per Skill
39	digit timer and clock		1 pcs per Competitor
40	Disposable Powder Free Nitrile Gloves		10 boxes per Skill+ 10 boxes additional
41	Distilled water	100L	100L
42	droppers	glass	5
43	Drying oven		1 pcs per Skill
44	Emergency floor shower		1 pcs per Skill
45	Erlenmeyer flasks with conical ground joint (100) with glass stoppers		15 pcs per Skill
46	Erlenmeyer flasks with conical ground joint, (250 ml)		4 pcs per Competitor
47	Erlenmeyer flasks without conical ground joint, narrow neck (100)		10 pcs per Skill

48	Ethanol	in Litre	5L per Skill
49	Face screen (82701WP96)		5 pcs per Skill+ 30 pcs additional
50	Fe(NO3)3 x 9H2O	250g	250g
51	filter funnel	25	25
52	filter paper	25 sheets	25 sheets
53	Filter Papers Grade 1 (240mm)		2 boxes per Skill
54	Filter Papers Grade 4 (240mm)		2 boxes per Skill
55	Fire extinguisher (Carbon dioxide)		4 pcs per Skill
56	Fire extinguisher (Powder)		2 pcs per Skill
57	Fume cupboard		5 pcs per Skill
58	Funnel holder		1 pcs per Competitor
59	funnel with short stem (100mm)		2 boxes per Skill
60	funnel with short stem (150mm)		2 boxes per Skill
61	funnel with short stem (35)		2 boxes per Skill
62	funnel with short stem (55mm)		2 boxes per Skill
63	G4 frit filter / glass ware	30ml	5
64	gas cylinder	as required	1
65	GCMS complete equipment set up	standard	1
66	Glass bottle / plastic container	2	2
67	glass Funnel, d 70 mm		3 pcs per Competitor
68	Glass rod		50 pcs per Skill
69	Glass storage bottles	10	
70	Goggles, GA501		30 pcs per Skill+ 30 pcs additional
71	graduated flask	100 ml	5
72	Graduated pipette (25 ml)		60 pcs per Skill
73	HCl solution	0.1 mol/l	2L
74	hose to connect	5 meter	5 meter
75	HPLC complete equipment set up	standard	1
76	HSE First Aid Kit		2 per Skill
77	Ice	Litre	10L
78	iodine solution ,	0.05 m	500ml
79	Laboratory glass bottles		10 pcs per Skill

80	Laboratory Glassware Washer with accessories		1 pcs per Skill
81	Laboratory Hot plate		2 pcs per Skill
82	Laboratory stand		16 pcs per Skill
83	Laboratory Table		16 pcs per Skill
84	Lifting platform		10 pcs per Skill
85	Magnetic hotplate stirrer		1 pcs per 2 Competitors
86	Magnetic stirrer without heating		1 pcs per 2 Competitors
87	Magnetic stirring bars		3 pcs per Competitor
88	measuring cylinder	50 ml	5
89	Measuring Cylinder (100 ml)	100 ml	20 pcs per Skill
90	Measuring Cylinder (250 ml)	250 ml	10 pcs per Skill
91	Measuring Cylinder (500 ml)	500 ml	10 pcs per Skill
92	measuring cylinder / graduated cylinder	10 ml	5
93	Measuring Cylinder, CLASS A (10 ml)		2 pcs per Competitor
94	Measuring Cylinder, CLASS A (25 ml)		2 pcs per Competitor
95	Measuring Cylinder, CLASS A ( 50 ml)		2 pcs per Competitor
96	measuring pipette	5 ml	5
97	Mechanical pipette, 1-channel, adjustable volume, 0.5-10µl		6 pcs per Skill
98	Mechanical pipette, 1-channel, adjustable volume, 100-1000µl		6 pcs per Skill
99	Mechanical pipette, 1-channel, adjustable volume, 10-100 µl		6 pcs per Skill
100	Metal spoon for lab (16 to 22 cm in length)		10
101	Mobile Hard disk		20 pcs per Skill
102	Mop		2 pcs per Skill
103	NaOH solution	0.25 mol/l	2L
104	Network filter with, at least, 3 sockets		2 pcs per Skill
105	Nitrile chemical resistant gloves		20 pcs per Skill+ 20 pcs additional
106	oven glove		12 pcs per Skill+ 30 pcs additional
107	Pasteur pipette, plastic		500 pcs per Skill
108	pH Electrode		3 pcs per Skill
109	pH Meter With Built-In Electrode Holder		2 pcs per Skill
110	pH-meter calibration sotutions ( pH 4, 7 and 10)		3 bottles per Skill
111	Photometer	standard	2

112	Pipette filler 3-valve		2 pcs per Competitor
113	Pipette stand		6 pcs per Skill
114	pipetting aid/ safety pipette filler / pipette bulb	100 ml	5
115	potassium hexacyanoferrate(II)lsg. 8.4 %,		5L
116	Precision balance		2 pcs per Skill
117	Refrigerator+ deep freezer		1 pcs per Skill
118	rubber vaccum adapters	Tapered Collar Rubber Stopper Buchner Funnel Flask Cones Adapter Set	2set
119	Safe (hazardous chemicals)	Chemical Resistant	1 pcs per Skill
120	Safe (highly toxic chemicals)	Chemical Resistant	1 pcs per Skill
121	safety trap	2	2
122	safty shield		
123	sample cuvette / vial	glass based	25
124	Scientific Calculator		15 pcs per Skill
125	Separating funnels, conical, with glass plug, without scale		10 pcs per Skill
126	Shelving		10 pcs per Skill
127	Sink bench		4 pcs per Skill
128	solvent storage bottle	10	10
129	solvents(DMF, IPA, methanol, acetonitrile, etc.)	10 * 1L	10L
130	solvents(DMF, IPA, methanol, acetonitrile, etc.)	10 * 1L	10L
131	standard flask	2L	2
132	standard flask	5L	2
133	standards and calibration with vendor support	as required	as required
134	Stirring bar remover		10 pcs per Skill
135	Stoppers, octagonal plate, plastic (14/23)		10 pcs per Skill
136	suction device / vaccum pump set up	2	2
137	Sulfuric acid ,	20%	1L
138	Tablet for marking		10 pcs per Skill
139	Tabouret		1 pcs per Competitor
140	test tubes	20 ml	250
141	Tips for automatic pipette		1200 pcs per Skill
142	Trash bin (10 L)		1 pcs per Competitor

143	Trash bin (50 L)		4 pcs per Skill
144	Trash bin(30L)		4 pcs per Skill
145	Utility clamp	metal	5
146	UV/Vis scanning Spectrophotometer		2 pcs per Skill
147	volumetric flask	500 ml	100
148	volumetric flask	250 ml	100
149	volumetric flask	1 ltr	10
150	Volumetric Flask with one graduation mark and plastic stopper, 50 ml		100 pcs per Skill
151	Volumetric Flask with one graduation mark and stopper, 25 ml		60 pcs per Skill
152	Volumetric Flask with one graduation mark AND STOPPER, CLASS A (1000 ml)		20 pcs per Skill
153	Volumetric Flask with one graduation mark AND STOPPER, CLASS A (250 ml)		50 pcs per Skill
154	Volumetric Flask with one graduation mark AND STOPPER, CLASS A (500 ml)		50 pcs per Skill
155	volumetric flasks	6 x 100 ml	300
156	volumetric pipette	50 ml	5
157	volumetric pipette	25 ml	10
158	volumetric pipette	5 ml	10
159	volumetric pipette	10 ml	10
160	Wash bottle	1L	25 pcs
161	Waste liquid recovery container		20 pcs per Skill
162	Watch glass(125 mm)		20 pcs per Skill
163	Water bath set up	40X30X10	1
164	Water cooler		2 pcs per Skill
165	Water Purification System: Milli-Q and ion exchanged water		1 pcs per Skill
166	weighing boats, plastic and glass		4 boxes per Skill
167	Windows OS (11)		10 pcs per Skill
168	Work bench	Laboratory Setup	1 pcs per Competitor

## Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Paper for print A4

2. Paper for print A3
3. Marker (Black)
4. Marker (Red)
5. Pencil (HB) with rubber in one end
6. Glass marker (pen - blue and/or black)
7. Notebook (A5)
8. Battery 5#
9. battery 7#
10. Folder for A4 paper format
11. Folder for A3 paper format
12. Clock on the wall
13. Tape/Glue
14. Scissors
15. Magnetic Whiteboard
16. Clip
17. Stapler (20 mm)
18. Steel ruler (300 mm)
19. Post-it
20. Table and Chair (22 Pc per Skill)
21. Office Chair (20 Pcs per Skill)
22. Screen and stand for projector
23. Video Projector

### Annexure: Industry Validations Summary: Not Applicable

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

S. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID	LinkedIn Profile (if available)

### Annexure: Training & Employment Details

Training and Employment Projections: Not Applicable

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities

*Data to be provided year-wise for 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	Placed	Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed

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

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

- 1.
- 2.

**Content availability for previous versions of qualifications:**

Participant Handbook  Facilitator Guide  Digital Content  Qualification Handbook  Any Other:

**Languages in which Content is available:**

**Annexure: Blended Learning (NA)**

**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	<input type="checkbox"/> Theory/ Lectures - Imparting theoretical and conceptual knowledge		
2	<input type="checkbox"/> Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners		
3	<input type="checkbox"/> Showing Practical Demonstrations to the learners		
4	<input type="checkbox"/> Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training		
5	<input type="checkbox"/> Tutorials/ Assignments/ Drill/ Practice		
6	<input type="checkbox"/> Proctored Monitoring/ Assessment/ Evaluation/ Examinations		
7	<input type="checkbox"/> On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training		

## 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
1. LFS/N0354, Ver 1.0 : Work organization and management	PC 1 Maintain personal health and safety at all times including through personal protective clothing and equipment	-	-	-	-
	PC 2 Perform work taking into account relevant regulations, norms, quality, safety and environmental standards	-	-	-	-
	PC 3 Implement safety data sheets and the measures and procedures derived from them for <ul style="list-style-type: none"> <li>Handling, maintaining, and repairing laboratory devices, apparatus, and equipment</li> <li>Handling, maintaining, and disposing of/recycling chemicals used in laboratories</li> </ul>	-	-	-	-
	PC 4 Follow risk management systems, proactively	-	-	-	-
	PC 5 Maintain good housekeeping	-	-	-	-
	PC 6 Order and inventory materials to maintain supplies, within budget and budgetary procedures	-	-	-	-
	PC 7 Ensure electronic equipment is fit for purpose	-	-	-	-
	PC 8 Inspect structures and materials for their condition and usability	-	-	-	-
	PC 9 Work independently, taking responsibility for initiating and completing tasks within the parameters of the work role	-	-	-	-
	PC 10 Estimate the requirements of a piece of work in terms of time, costs, resources, and materials needed for completion.	-	-	-	-
	PC 11 Develop specific goals and plans to prioritize, organize, and accomplish work, relative to set objectives and targets	-	-	-	-
	PC 12 Investigate alternative means of resolving delays	-	-	-	-
	PC 13 Adjust activities as required, keeping relevant others informed	-	-	-	-
<b>Total Marks</b>		<b>30</b>	<b>70</b>	<b>0</b>	<b>0</b>
2. LFS/N0355, Ver 1.0: Communication and interpersonal skills	PC 1 Establish and maintain interpersonal relations	-	-	-	-
	PC 2 Work and interact with others including within teams	-	-	-	-
	PC 3 Provide technical support to chemists or other specialists	-	-	-	-
	PC 4 Communicate using a full range of techniques for speaking, writing, body language, and active listening, for formal and informal purposes	-	-	-	-
	PC 5 Use specialist terminology including where these are in another language	-	-	-	-
	PC 6 Obtain information from all relevant sources, citing sources as required	-	-	-	-
	PC 7 Read and apply the content of technical documents relating to <ul style="list-style-type: none"> <li>Analyses</li> <li>Formulations</li> <li>Procedural instructions</li> <li>Specifications</li> <li>Diagrams</li> </ul>	-	-	-	-

	PC 8 Listen actively, asking questions appropriately for full understanding	-	-	-	-
	PC 9 Use laboratory information and laboratory management systems, both digital and paper based	-	-	-	-
	PC 10 Order information and actions according to logic or given rules	-	-	-	-
	PC 11 Apply statistical techniques for data presentation	-	-	-	-
	PC 12 Use a range of textual and graphical methods to inform others	-	-	-	-
	PC 13 Communicate scientific information appropriately for the audience or recipient	-	-	-	-
	PC 14 Prepare and give formal and informal presentations	-	-	-	-
	PC 15 Seek, accept and, as appropriate, build on feedback and constructive criticism	-	-	-	-
	<b>Total Marks</b>	<b>30</b>	<b>70</b>	<b>0</b>	<b>0</b>
<b>3. LFS/N0356, Ver 1.0: Techniques, procedures, and methods</b>	PC 1 Prepare for laboratory tasks using the appropriate scientific techniques, procedures, and methods	-	-	-	-
	PC 2 Use specified instrumentation and laboratory equipment, including calibration as required	-	-	-	-
	PC 3 Evaluate the quality of materials or products to be used	-	-	-	-
	PC 4 Design or fabricate experimental apparatus to develop new products or processes	-	-	-	-
	PC 5 Perform laboratory tasks using specified methodologies, including standard operating procedures	-	-	-	-
	PC 6 Perform specific sampling duties including preparation and processing of samples as well as separation processes for mixtures of liquids and solids	-	-	-	-
	PC 7 Perform cleaning and concentration processes such as <ul style="list-style-type: none"> <li>• Distilling</li> <li>• Extracting</li> <li>• Evaporating</li> <li>• Chromatography</li> <li>• Potentiometry</li> <li>• Conductometry</li> </ul>	-	-	-	-
	PC 8 Use titrimetric, volumetric, and gravimetric methods	-	-	-	-
	PC 9 Use instrumental and electroanalytical methods such as <ul style="list-style-type: none"> <li>• Photometry</li> <li>• Chromatography</li> <li>• Potentiometry</li> <li>• Conductometry</li> <li>• Electrophoresis</li> </ul>	-	-	-	-
	PC 10 Set up and conduct experiments, extractions, tests, and analyses, using techniques such as <ul style="list-style-type: none"> <li>• Chromatography</li> <li>• Spectroscopy</li> <li>• Physical or chemical separation techniques</li> <li>• Microscopy</li> <li>• Electrophoresis</li> </ul>	-	-	-	-
	PC 11 Determine the structures of organic and inorganic compounds	-	-	-	-

	PC 12 Use synthesis techniques for organic, inorganic and polymer synthesis	-	-	-	-
	PC 13 Prepare chemical solutions for products or processes, following standardized formulae, or create experimental formulae	-	-	-	-
	PC 14 Take account of the need for validation of analytical procedures, methods, and instrumentation, including the use of suitable sampling methods.	-	-	-	-
	<b>Total Marks</b>	<b>30</b>	<b>70</b>	<b>0</b>	<b>0</b>
<b>4. LFS/N0357, Ver 1.0 : Data processing and record keeping</b>	PC 1 Log and document laboratory work, including by using given house style, IT and statistical methods	-	-	-	-
	PC 2 Process and collate digital information from automated digital machines	-	-	-	-
	PC 3 Produce reliable, accurate data	-	-	-	-
	PC 4 Present the results of laboratory work and problem solving clearly and concisely in written and oral form	-	-	-	-
	PC 5 Write technical reports, using graphs and charts as appropriate	-	-	-	-
	PC 6 Check own work for codification, categorization, calculations, tabulations, and completeness	-	-	-	-
	PC 7 Acknowledge errors, inaccuracies, and shortcomings promptly	-	-	-	-
	PC 8 Arrange for information or data to be verified or audited	-	-	-	-
	PC 9 Archive documentation	-	-	-	-
	<b>Total Marks</b>	<b>30</b>	<b>70</b>	<b>0</b>	<b>0</b>
<b>5. LFS/N0358, Ver 1.0 : Analysis, interpretation, and evaluation</b>	PC 1 Maintain efficient kinaesthetic and fine motor skills	-	-	-	-
	PC 2 Apply personal techniques for sustained attentiveness and focus	-	-	-	-
	PC 3 Follow procedures to meet the workplace's quality standards	-	-	-	-
	PC 4 Analyse, interpret, and evaluate data and identify results requiring further investigation	-	-	-	-
	PC 5 Evaluate information to determine compliance with standards	-	-	-	-
	PC 6 Work autonomously within the parameters of the work role	-	-	-	-
	PC 7 Identify the meaning of outputs from the analytical techniques used and assess their importance	-	-	-	-
	PC 8 Use correct computational, statistical, and mathematical methods or formulae to solve problems	-	-	-	-
	PC 9 Identify by analysis the underlying principles, reasons, or facts determining results	-	-	-	-
	<b>Total Marks</b>	<b>30</b>	<b>70</b>	<b>0</b>	<b>0</b>
<b>6. LFS/N0359 , Ver 1.0: Problem solving through the application of scientific methods</b>	PC 1 Recognize when there is either a problem or the likelihood of a problem	-	-	-	-
	PC 2 Identify or detect patterns within larger and distracting material	-	-	-	-
	PC 3 Apply suitable scientific methods to identify causes and achieve solutions	-	-	-	-
	PC 4 Use logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems by, for example:	-	-	-	-
	• Applying general rules to specific issues to produce reasonable conclusions				
	• Combining pieces of information to form reasonable conclusions or rules				
	PC 5 Use creative thinking and problem solving to challenge assumptions, innovate, make new proposals, and build on existing ideas	-	-	-	-

<b>7. LFS/N0360 , Ver 1.0: Trends in applied Chemistry</b>	PC 6 Seek advice from senior colleagues as appropriate	-	-	-	-
	PC 7 Make recommendations for improved workflows or scientific solutions	-	-	-	-
	PC 8 Support new investigations and follow-up experiments for routine and non-routine analytical tasks	-	-	-	-
	PC 9 Take responsibility for personal development, demonstrating commitment to learning and self-improvement	-	-	-	-
	<b>Total Marks</b>		<b>30</b>	<b>70</b>	<b>0</b>
	PC 1 Install, commission and test automated laboratory systems	-	-	-	-
	PC 2 Install and configure programs	-	-	-	-
	PC 3 Develop simple programs	-	-	-	-
	PC 4 Switch on, switch off and operate automated laboratory systems	-	-	-	-
		PC 5 Optimize and implement adjustments and changes to automated laboratory systems	-	-	-
		PC 6 Maintain and service automated laboratory systems	-	-	-
		PC 7 Systematically search, localize, and eliminate faults, defects, and malfunctions on automated laboratory systems	-	-	-
		PC 8 Respond appropriately to change and change management processes	-	-	-
		<b>Total Marks</b>		<b>30</b>	<b>70</b>
		<b>Grand Total</b>		<b>210</b>	<b>490</b>
				<b>0</b>	<b>0</b>

## Annexure: Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

### 1. Assessment System Overview:

The assessment for the Training will be conducted toward the end of the training duration. The assessment of the qualification shall be carried out by NCVET approved assessment agencies empaneled by LSSSDC after a defined evaluation process. For Execution of the assessment for training for the qualification, LSSSDC will be engaging more than one NCVET approved assessment agency/ body.

#### 1.1 Criteria of selection of assessment body/agency:

The assessment body/agency is selected based on:

- Prior experience and understanding of Life Sciences or similar sector.
- Experience in conducting assessments for similar job roles.
- Manpower and Technical capabilities.
- Geographical reach
- Existing Network in the Life Sciences Sector
- Agencies internal policies to maintain standards, quality & professional Integrity
- Agencies policy and practices in assessor management
- NCVET approval

#### 1.2 Assessment tool development for assessment of Training:

For the Training assessment, the assessment instrument development is done by the selected assessment body with close monitoring and support of LSSSDC at every stage.

##### 1.2.1 Digital Written test for knowledge assessment:

Scope – Is used to test the knowledge component of the Qualification/ Micro Credential/ NOS.

Tools – computer or tab based online or offline.

Method – objective type questions, match the columns, fill in the blanks, tick the odd man out, choose the correct option, choose the best answer, True or false, Identify the object, tool or machinery, arrange in proper sequence, case study, scenario-based responses.

Analysis – Question paper is divided into sections. Each Section intends to assess a particular knowledge field of the trainee. Thus, section-wise calculation of marks gives a clear idea of the areas of improvement or expertise of the trainee. While a consolidated mark gives the overall rating of the trainee.

##### 1.2.2 Digital Written test for skill assessment:

Scope – Is used to test primarily the Skill component of the Qualification/ Micro Credential/ NOS. Trainee's expertise in handling and managing the situation is tested.

Tools – computer or tab based online or offline questions

Method – A situation is narrated or created in the question posed to the trainee and he is asked objective type questions to select the correct reaction to the situation. The selected situations are based on real situations.

Analysis – Question paper is divided into sections. Each Section intends to assess a particular skill field of the trainee. Thus, section-wise calculation of marks gives a clear idea of the areas of improvement or expertise of the trainee. While a consolidated mark gives the overall rating of the trainee.

#### 1.3 Steps for assessment tool development:

- The selection of assessment tool(s) is done as per the assessment criteria prescribed in Qualification/ Micro Credential/ NOS.
- For Chemist Laboratory Technician assessment, a blueprint of the question paper is part of the assessment tool for training.
- Development of layout of Question paper is such that the entire PCs (Performance Criteria) of that Qualification/ Micro Credential/ NOS are covered.
- Score per question maps with the weightage given to that PC, in the assessment criteria, and the level of difficulty of the question.
- An expert from industry is selected who is called “Subject Matter Expert” (SME). This SME must have over 13-15 years of experience in the industry in Quality occupation.
- SME is screened and approved by LSSDC. He/she is oriented by both LSSDC and Assessment agency on – creating question Bank, level of questions, end the desired outcome of the assessment.

#### 1.4 Execution of Training Assessment/ RPL Assessment:

- Once the assessment date for training is decided with common agreement of Industry/ Vocational Training Centre and LSSDC, LSSDC allocates the batch to an NCVET approved and LSSDC empaneled assessment body/agency.
- Assessment agency ensures
  - the availability of required infrastructure
  - the availability of validated assessment tools for the assessment of training for the assigned qualification
  - the availability of assessor as per assessor eligibility criteria of the qualification
- Assessment agencies send the assessment confirmation to VTP/TC looping SSC
- Assessment agency deploys LSSDC certified assessor for executing the assessment
- LSSDC monitors the assessment process & records
- The assessment is executed in three possible ways depending on the choice of the industry as use of this qualification in India Skills Competitions:

##### 1.4.1 Tab based assessment using physical proctoring

##### 1.4.2 Smartphone-based assessment using e-proctoring

##### 1.4.3 India Skill Competition

##### 1.4.1 Tab-based assessment using physical proctoring

- A representative from the Assessment agency is present on the day of assessment to executing the assessment at the venue in case of physical proctoring.
- The assessment agency representative carries an identity card and letter from the council authorizing to conduct the assessment.

- Assessment agency representative ensures the authenticity of Trainee's identity by verifying the documents (any document issued by GOI, such as Ration card, Aadhaar Card, Driving License, Passport, Election card, etc)
- The assessment agency representative maintains the records of attendance, verified documents, and tablet instruments used in the assessment.
- Assessment agency representative collects evidence of the assessment in the best possible way (videos, pictures, voice recordings, etc)
- Assessment agency representative transfers the assessment scores from tab to assessment agency server, using a secure, encrypted web-based program.
- The assessment agency after processing the results and putting them in standard format hands over to LSSSDC within 7 days of assessment.

#### 1.4.2 Smartphone-based assessment using e-proctoring

- All trainees enrolled in the batch due for assessment, are registered on an assessment tool application using their unique mobile number and e-mail ID along with a Govt. ID issued proof.
- An assessment link is sent to the mail ID of each trainee with a defined expiry date of the link.
- Trainee at any location can click on the link using his/her smartphone or a web camera-enabled computer system
- Using the unique credentials and Govt ID number, the trainee logs in for the start of assessment and completes the assessment.
- The authenticity of Trainee's identity is done by assessment application by verifying the documents (any document issued by GOI, such as Ration card, Aadhaar Card, Driving License, Passport, election card, etc.) and a live photo capture
- A live video of the candidate during the assessment is captured to collect the evidence of the assessment
- Once the assessment is complete, the assessment application automatically assessment scores to the assessment agency server, using a secure, encrypted web-based program.
- The assessment agency after processing the results and putting them in standard format hands over to LSSSDC within 7 days of assessment.

#### 1.4.3 India Skill Competition

- The Separate guidelines are issued by competent authorities periodically defining the strategies and modus operandi for conducting assessment at various stages of India Skills Competition. The same shall be adopted and followed in relevance to the qualification of Chemical Laboratory Technology.
- The testing environment, evidences and records shall be arranged in line to the assessment guidelines of India Skills Competition.
- The assessment process shall be through formative assessment in the form of competition.
- India Skill eligibility assessment shall be on-line e-proctored assessment.
- For India Skill -State level, pre-national level and National- level competition assessment, the assessment shall be carried out through the industry experts who shall be trained and certified by LSSSDC as Certified trainer or assessor for India Skills Competition through the recognized assessment agencies.

## 2. Testing Environment:

- The Centre/ location of the assessment is pre decided and geo tagged in case of physical assessment
- The assessment of LSSDC qualifications is 99% done in digital environment while 1% pen and paper is used ONLY in business exigencies
- Based on the size of batch the assessment duration/ no. of required assessors is decided to ensure detailed assessment without any negative impact on quality of assessment
- The system driven automated assessment management system ensures uniform time allocation to each student, unique logins for each student and automated randomization of questions for developing multiple sets of question paper for single batch.
- Identity check of the student is mandated
- In case of India Skill Competition Assessment, the testing environment, shall be arranged in line to the assessment guidelines of India Skills Competition.

## 3. Assessment Quality Assurance levels/Framework:

- Question bank is created by the Subject Matter Experts (SME) of Assessment Agency are verified by the other SME of LSSDC
- All Questions are mapped to the specified assessment criteria
- Assessor eligibility criteria are structured to ensure quality and knowledge credentials of an assessor like-wise the trainer's quality and knowledge credentials.
- Eligible Assessor must be certified by LSSDC for the respective and relevant qualification
- The tools used for assessment are validated for relevance and feasibility for skill assessment of the qualification in consideration
- In case of India Skill Competition Assessment, the assessment quality assurance levels and framework shall be ensured in line to the assessment guidelines of India Skills Competition and world skills competition guidelines.

## 4. Types of evidence or evidence-gathering protocol:

- Time-stamped & geotagged reporting of the assessor from assessment location
- ID Proof of the students
- Educational qualification of students
- Certificate of Trainer
- In case of Physical assessment, geotagged photographs of the students undergoing assessment
- While students are undergoing assessment on the digital assessment platform the system captures random photos of the student which is audited by LSSDC

- In case of India Skill Competition Assessment, the evidences shall be recorded and stored in compliance to the assessment guidelines of India Skills Competition.

#### 5. Method of verification or validation:

- Surprise visit to the assessment location
- ID Proof of the students for identity verification
- Educational qualification verification of students for validation of entry level criteria
- Certificate of Trainer to verify the credential of vocational educator
- Random photos taken by the digital system are verified during audit by the assessment team
- In case of India Skill Competition Assessment, the assessment verification / validation shall be assured in compliance to the assessment guidelines of India Skills Competition.

#### 6. Method for assessment documentation, archiving, and access

- Hard copies and digital copies (whichever is applicable) of the assessment evidences are stored with assessment agency team for 5 years
- Assessment transcripts are stored in the server space of assessment agency for 5 years
- Assessment question banks and validation records are stored with assessment agency and LSSDC digitally
- Assessment records are archived with assessment agency archive server after 5 years for another 5 years
- Access of assessment records are controlled with restricted access to concerned department and stakeholders and is shared on demand after due approval of Head of Assessment and Certification-LSSDC
- In case of India Skill Competition Assessment, the evidences shall be recorded and stored in compliance to the assessment guidelines of India Skills Competition.

#### Annexure: Acronym and Glossary

##### Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
ISCO	International Standard Classification of Occupations
NCO	National Classification of Occupations
NCrF	National Credit Framework

<b>NOS</b>	National Occupational Standard(s)
<b>NQR</b>	National Qualification Register
<b>NSQF</b>	National Skills Qualifications Framework
<b>OJT</b>	On the Job Training

**Glossary**

<b>Term</b>	<b>Description</b>
<b>National Occupational Standards (NOS)</b>	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.
<b>Qualification</b>	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
<b>Qualification File</b>	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.
<b>Sector</b>	A grouping of professional activities on the basis of their main economic function, product, service or technology.
<b>Long Term Training</b>	Long-term skilling means any vocational training program undertaken for a year and above. <a href="https://ncvet.gov.in/sites/default/files/NCVET.pdf">https://ncvet.gov.in/sites/default/files/NCVET.pdf</a>