

QUALIFICATION FILE

Building Management System Service Engineer

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

NCrF/NSQF Level: 5

Submitted By:

Electronics Sector Skills Council of India (ESSCI)

155, 2nd Floor, ESC House

Okhla Industrial Area - Phase 3,

New Delhi – 110020

Tel: 011 – 8447738501

Table of Contents

Section 1: Basic Details.....	3
Section 2: Module Summary	5
NOS/s of Qualifications	5
Mandatory NOS/s:.....	5
Elective NOS/s:.....	6
Optional NOS/s:.....	6
Section 4: Assessment Related	7
Section 5: Evidence of the need for the Qualification.....	7
Section 6: Annexure & Supporting Documents Check List	8
<i>Specify Annexure Name / Supporting document file name</i>	<i>8</i>
Annexure: Evidence of Level.....	9
Annexure: Tools and Equipment (Lab Set-Up).....	10
Annexure: Industry Validations Summary	11
Annexure: Training Details	13
Annexure: Detailed Assessment Criteria.....	16
Annexure: Assessment Strategy	24
Annexure: Acronym and Glossary	26

Section 1: Basic Details

1.	Qualification Name	Building Management System Service Engineer														
2.	Sector/s	Electronics														
3.	Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options ☐ OEM	NQR Code & version of existing/previous qualification: (change to previous, once approved)- 2022/EHW/ESSC/05388 & V2.0		Qualification Name of existing/previous version: Building Management System Service Engineer												
4.	a. OEM Name b. Qualification Name (Wherever applicable)	NA														
5.	National Qualification Register (NQR) Code & Version (Will be issued after NSQC approval)	QG-05-EH-03979-2025-V3-ESSCI		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	A Building Management System Service Engineer is responsible for installing the Building Management System (BMS) at the client premises. The person is also responsible for monitoring the BMS for the correct functioning and carrying out its regular repair and maintenance.														
9.	Eligibility Criteria for Entry for Student/Trainee/Learner/Employee	a. Entry Qualification & Relevant Experience: <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>UG Diploma in the relevant field (Physics/ Electronics /Electrical/Mechanical)</td> <td>1.5 experience required</td> </tr> <tr> <td>2</td> <td>3 Years Diploma after 10th (Electronics/Electrical/ Mechanical)</td> <td>3 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> #Relevant Exp in Industrial Automation. b. Age: NA			S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)	1	UG Diploma in the relevant field (Physics/ Electronics /Electrical/Mechanical)	1.5 experience required	2	3 Years Diploma after 10 th (Electronics/Electrical/ Mechanical)	3 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	UG Diploma in the relevant field (Physics/ Electronics /Electrical/Mechanical)	1.5 experience required														
2	3 Years Diploma after 10 th (Electronics/Electrical/ Mechanical)	3 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))	19		11. Common Cost Norm Category (I/II/III) (wherever applicable): I												
12.	Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)	NA														

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

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 ☐ Online ☒ Blended					
		Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)
		Classroom (offline)	00:00	210:00	180:00	00:00	570:00
		Online	180:00	00:00	00:00	00:00	
(Refer Blended Learning Annexure for details)							
14.	Aligned to NCO/ISCO Code/s (if no code is available mention the same)	NCO-2015/7411.0100					
15.	Progression path after attaining the qualification (Please show Professional and Academic progression)	Building Management System Project Manager					
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 Role Amenable to Persons with Disability	☐ Yes ☒ No If "Yes", specify applicable type of Disability:					
19.	How Participation of Women will be Encouraged	No gender sensitization					
20.	Are Greening/ Environment Sustainability Aspects Covered (Specify the NOS/Module which covers it)	☒ Yes ☐ No Employability Skills (DGT/VSQ/N0102)					
21.	Is Qualification Suitable to be Offered in Schools/Colleges	Schools ☐ Yes ☒ No Colleges ☒ Yes ☐ No					
22.	Name and Contact Details of Submitting / Awarding Body SPOC (In case of CS or MS, provide details of both Lead AB & Supporting ABs)	Name: Saleem Ahmed Email: ceo@essc-india.org Contact No.: 011 – 8447738501 Website: https://www.essc-india.org/					
23.	Final Approval Date by NSQC: 07.05.2025	24. Validity Duration: 3 Years				25. Next Review Date: 30.04.2028	

Section 2: Module Summary

NOS/s of Qualifications

(In exceptional cases these could be described as components)

Mandatory NOS/s:

Specify the training duration and assessment criteria at NOS/ Module level. For further details, refer curriculum document.

Th.-Theory **Pr.**-Practical **OJT**-On the Job **Man.**-Mandatory Training **Rec.**-Recommended **Proj.**-Project

S. No	NOS/Module Name	NOS/Module Code & Version (if applicable)	Core/ Non-Core	NCrF/ NSQF Level	Credits as per NCrF	Training Duration (Hours)					Assessment Marks					
						Th.	Pr.	OJT-Man.	OJT-Rec.	Total	Th.	Pr.	Proj.	Viva	Total	Weightage (%) (if applicable)
1	Prepare for installing the BMS	ELE/N7205 & V2.0	Core	5	4	66	24	30	0	120	30	40	0	30	100	20
2	Carry out the installation of BMS	ELE/N7206 & V2.0	Core	5	4	30	30	60	0	120	30	40	0	30	100	20
3	Carry out commissioning and testing of BMS	ELE/N7208 & V2.0	Core	5	4	30	60	30	0	120	30	40	0	30	100	20
4	Carry out repair and maintenance of BMS	ELE/N7207 & V2.0	Core	5	5	30	60	60	0	150	30	40	0	30	100	20
5	Employability Skills (60 hours)	DGT/VSQ/N0102 & V1.0	Non-core	4	2	24	36	0	0	60	20	30	0	0	50	20
Duration (in Hours) / Total Marks					19	180	210	180	0	570	140	190	0	120	450	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

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: % (Every Trainee should score specified minimum passing percentage in each mandatory and selected elective NOS/Module to successfully clear the assessment.)

Section 3: Training Related

1.	Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Diploma/ITI (Electrical/Electronics/Mechanical) with 2 years industrial and 1 years training experience in the field of BMS service Engineering/Building Automation. Or Certified in relevant CITS Trade
2.	Master Trainer's Qualification and experience in the relevant sector (in years) (as per NCVET guidelines)	Diploma/ITI (Electrical/Electronics/Mechanical) with 3 years industrial and 1 years training experience in the field of BMS service Engineering/Building Automation.

		Or Certified in relevant CITS Trade
3.	Tools and Equipment Required for Training	☒ Yes ☐ No (If "Yes", details to be provided in Annexure)
4.	In Case of Revised Qualification, Details of Any Upskilling Required for Trainer	NA

Section 4: Assessment Related

1.	Assessor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma/ITI (Electrical/Electronics/Mechanical) with 3 years industrial and 1 years training experience in the field of BMS service Engineering/Building Automation. Or Certified in relevant CITS Trade
2.	Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma/ITI (Electrical/Electronics/Mechanical) with 4 years industrial and 1 years training experience in the field of BMS service Engineering/Building Automation. Or Certified in relevant CITS Trade
3.	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) (as per NCVET guidelines)	Diploma/ITI (Electrical/Electronics/Mechanical) with 4 years industrial and 1 years training experience in the field of BMS service Engineering/Building Automation. Or Certified in relevant CITS Trade
4.	Assessment Mode (Specify the assessment mode)	Blended
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 the 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): Yes
4.	Number of Industry validation provided: 21

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

5.	Estimated nos. of persons to be trained and employed: 500
6.	Evidence of Concurrence/Consultation with Line Ministry/State Departments: Yes If “No”, why:

Section 6: Annexure & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	Annexure: NCrf/NSQF level justification based on NCrf level/NSQF descriptors (Mandatory)	Attached
2.	Annexure: List of tools and equipment relevant for qualification (Mandatory, except in case of online course)	Attached
3.	Annexure: Detailed Assessment Criteria (Mandatory)	Attached
4.	Annexure: Assessment Strategy (Mandatory)	Attached
5.	Annexure: Blended Learning (Mandatory, in case selected Mode of delivery is “Blended Learning”)	Filled
6.	Annexure: Multiple Entry-Exit Details (Mandatory, in case qualification has multiple Entry-Exit)	Filled
7.	Annexure: Acronym and Glossary (Optional)	Attached
8.	Supporting Document: Model Curriculum (Mandatory – Public view)	Attached
9.	Supporting Document: Career Progression (Mandatory - Public view)	Attached
10.	Supporting Document: Occupational Map (Mandatory)	Attached
11.	Supporting Document: Assessment SOP (Mandatory)	
12.	Any other document you wish to submit:	

Annexure: Evidence of Level

	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	Demands a wide range of specialized technical skill, clarity of knowledge and practice in a broad range of activity involving standard and non-standard practices. • Check the availability of required resources • Check the resources against the quality parameters • Install conduits and carry out cabling • Prepare for installing the BMS • Carry out repair and maintenance of BMS field devices • Manage the BMS helpdesk, complaints and requests	A Building Management System Service Engineer is responsible for installing the Building Management System (BMS) at the client premises. The person also is responsible for monitoring the BMS for the correct functioning and carrying out its regular repair and maintenance.	5
Professional and Technical Skills/ Expertise/ Professional Knowledge	Basic knowledge of electronics involved in hardware, how to operate the system and other hardware peripherals • Knowledge of installation of a building management system as per the plan • Knowledge of the process involvement of the BMS. • Knowledge of repair and maintenance of BMS • Knowledge of basic parameters and time management on repair time, turnaround time.	A Building Management System Service Engineers should know the knowledge of different processes involved in planning, repair/maintenance and then verifying the results as per the requirements. Hence Level 5	5
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study. • Carry out repair and maintenance of BMS field devices • Carry out repair and maintenance of electrical panels • Manage the BMS helpdesk, complaints	A Building Management System Service Engineer should have the knowledge of monitoring the BMS for the correct functioning. Also, installation and regular repair maintenance of the BMS system at client premises. Hence Level 5	5

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

	and requests ● Maintain the records		
Broad Learning Outcomes/Core Skill	Reasonably good in installing and configuring peripherals. ● Effective waste management/recycling practices ● Check the resources against the quality parameters ● Follow emergencies, rescue and first-aid procedures ● Work effectively	A Building Management System Service Engineer is responsible for installing the Building Management System (BMS) at the client premises. The person also is responsible for monitoring the BMS for the correct functioning and carrying out its regular repair and maintenance. Hence Level 5	5
Responsibility	Responsibility of completing the work assigned and reporting the same as per standards. ● Understand the job role and follow the organisational policy ● Record and report about the work status ● Follow safety regulations at work place ● Work along with colleagues and supervisors.	A Building Management System Service Engineer is responsible for installing the Building Management System (BMS) at the client premises. Hence Level 5	5

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

Batch Size: 30

S. No.	Tool / Equipment Name	Specifications	Quantity for specified Batch size
1	Marker	Pieces	12
2	Projector	Pieces	1
3	Laptop	Pieces	1
4	Damper Actuators	Pieces	5
5	Valve Actuators	Pieces	5
6	Variable Speed Drives (VSD)	Pieces	1
7	Pumps Fans Motors	Pieces	5
8	Water Flows Pressures	Pieces	5
9	Voltages Currents	Pieces	5
10	Temperature Relative Humidity (CO2) Measurement Equipment	Nos	2
11	Automation level controllers	Nos	1
12	BACnet router / Gateway	Nos	1

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

13	LAN Controller	Nos	1
14	VAV Controller	Nos	1
15	VAV BOX	pieces	1
16	Alarm	pieces	5
17	Monitor and Control Field Points	pieces	5
18	BMS Network	pieces	1
19	Graphic User Interface (GUI)	pieces	1
20	Control Application Programming	pieces	1
21	Energy Management Software	Nos	1
22	Lighting Control System	pieces	5
23	CCTV	pieces	5
24	Security Network / System	pieces	5
25	Fire Alarm Systems	pieces	5
26	Smoke detector	pieces	5
27	Heat Detector	pieces	5
28	Emergency and Safety Sign	pieces	5
29	Fire extinguishers	pieces	5

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Whiteboard
2. Projector
3. Computer/Laptop
4. Chairs
5. Tables
6. Whiteboard marker

Annexure: Industry Validations Summary

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)
1	Access Edutech Pvt. Ltd.	Sanjay Kumar Mishra	Director	96, Vrindavan Nagar Ayodhya Bypass Road Bhopal	7000650224	sanjaymishra@access-edutech.com	

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

2	Artificial Intelligence Technologies	Rohit Kumar Sharma	Manager – Product Development	A-21, Sector 4, Block A, Kailash Colony, Greater Kailash, New Delhi	9927564461	rohit.sharma@aituniversitysal.com	
3	Conduent	Prince Jain	Senior Business Analyst	Candor Tech Space, IT/ITES SEZ., Noida, Uttar Pradesh 201304	8439385780	prince.jain@conduent.com	
4	Ephicacy Lifescience Analytics	Rahul Kumar Kaushik	Senior Software Engineer	2nd Main Rd, Sarvobhogam Nagar, Arekere, Bengaluru, Karnataka 560076	8859885973	Rahul.Kaushik@ephicacy.com	
5	Involute Automation Pvt. Ltd.	Vijaya Chandra	Operations In-Charge	Plot no:12, Technocrats Industrial Estate, Balanagar, Hyderabad, Telangana- 500037	9959232315	vijayachandra@involute training.com	
6	Nagravision India Pvt. Ltd.	Avinash Yadav	Manager – System Administrator	RMZ Centennial, Tower C unit 301 and 302, Mahadevapura Post ITPL Road, Bangalore, India	9808326626	avinash.yadav@nagra.com	
7	Nexgen Exhibitions Pvt. Ltd.	Saurabh Purwar	Director	1201/1206 Pragati Tower, 26 Rajendra Place, New Delhi- 110008, India	9457306691	fbvidgo@gmail.com	
8	SHIV SHAKTI TECKNIKI EVAM SAMANAYA SHIKSHAN SANSTHAN	Jitendra Kumar Garg	President	B 32 MAHESH NAGAR JAIPUR RAJASTHAN-302015	9782912782	jitendra.garg303@gmail.com	
9	Sri Venkateswara College of Engineering	Dr. C Chandrasekhar	Head R&D & Professor in ECE	Karakambadi Road, Tirupati- 517507	9177217190	dr.chandrasekhar.c@sv colleges.edu.in	
10	Siemens Limited	Manoj Belgaonkar	Head – Regulations, Standards and QM	R&D Centre, Thane Belapur Road, Airoli, Navi Mumbai 400708	9820682825	manoj.belgaonkar@siemens.com	

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

11	Tata Consultancy Services	Sheepara Kaushik	Consultant – Product Development	Level 3, Kensington B Wing, Hiranandani SEZ, Powai, Mumbai 400076	8433595090	sheepara.sharma@tcs.com	
12	Yaduvanshi Private ITI	Yadvendra	Principal	TC229199 - YADUVANSHI PVT ITI, Hasampur, Neemkathana, Sikar, Rajasthan, PIN - 332718	8432882688	yaduvanshicollege2008@gmail.com	
13	Sai Skill Tech	Satyanarayana	Director	1-2-66/2, Street No. 1, Kakatiya Nagar, Habsiguda, Hyderabad-07	9866558375	saiskilltech@gmail.com	
14	Microtek College of Management & Technology	Rashid Khan	Academic Director	D-18 Industrial Estate, Aligarh, UP-202001	9568010190	info@microtek.ac.in	
15	ACE Automation Engineers	Rajesh Sharma	Technical Head	Plot No. 3, Sector-6, IMT Manesar, Gurgaon, Haryana	9312345678	rajesh.sharma@aceauto.com	
16	Precision Automation & Robotics India Ltd.	Snehal Joshi	Training Manager	Pune Nagar Road, Sanaswadi, Pune - 412208	9503221100	snehal.joshi@pari.com	
17	ITM University	Anand Dixit	Head of Department	Sector 23A, Gurgaon, Haryana – 122017	9876543210	anand.dixit@itmindia.edu	
18	RKDF University	Dr. Sushil Kumar	Dean - Engineering	Airport Bypass Road, Gandhi Nagar, Bhopal – 462033	7890123456	sushil.kumar@rkdf.ac.in	
19	Phoenix Automation	Naveen Rathi	Technical Director	Phase-1, IDA Jeedimetla, Hyderabad – 500055	9988776655	naveen.rathi@phoenixauto.in	
20	AMTZ – Andhra Med Tech Zone	Meena Kumari	Head – Skilling Division	Pragati Maidan, Vishakhapatnam – 530012	9090909090	meena.k@amtz.in	
21	Arka Industrial Automation	Ravi Teja	Project Manager	Kukatpally, Hyderabad – 500072	9000001111	ravi.teja@arkautomation.com	

Annexure: Training Details

Training and Employment Projections:

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

Year	Total Candidates	Women	People with Disability
	Estimated Training # Total	Estimated Training # Women	Estimated Training # PwD
2025-26	150	NA	NA
2026-27	150	NA	NA
2027-28	200	NA	NA

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
3.0	2022-23	35	32	29	NA	NA	NA	NA	NA	NA	NA	NA	NA
3.0	2023-24	61	55	55	NA	NA	NA	NA	NA	NA	NA	NA	NA
3.0	2024-25	192	191	170	NA	NA	NA	NA	NA	NA	NA	NA	NA

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.

Content availability for previous versions of qualifications:
☒ Participant Handbook
☒ Facilitator Guide
☐ Digital Content
☐ Qualification Handbook
☐ Any Other:
Languages in which Content is available:

1. English

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	• Books/ e-books • Presentations • Reference Material • Audio / Video Modules	30:70
2	☒ Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	• Self-Learning Videos • Broadcasts • Mobile Learning • Curated Digital content	30:70
3	☒ Showing Practical Demonstrations to the learners	• Video Content • E-Resource library • AR/ VR/ XR	30:70
4	☒ Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	• Training tools (tools list attached) • Video Play • Presentations	30:70
5	☒ Tutorials/ Assignments/ Drill/ Practice	• Online Question Bank • Mobile Quick test app • MCQ based tests	30:70
6	☒ Proctored Monitoring/ Assessment/ Evaluation/ Examinations	• Assessment engine for Essays • Up-loadable file examinations • Mock test sessions	30:70

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

7	☒ On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	- Online tests - Offline assessments	30:70
---	---	---	-------

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
ELE/N7205: Prepare for installing the BMS	<i>Check the availability of required resources</i>	10	12		8
	PC1. co-ordinate with the relevant company personnel/ third-party supplier to ensure timely delivery of all the necessary apparatus for the installation of BMS such as Direct Digital Controller (DDC), sensors, actuators, relevant types of cables, Human Machine Interface (HMI) display, computer, server, etc.	3	3		2
	PC2. check that all the components are delivered as per the order	3	3		2
	PC3. arrange the necessary tools, equipment, and Personal Protective Equipment (PPE) for the installation	3	3		2
	PC4. ensure the availability of trained personnel to assist with the installation process	1	3		2
	<i>Check and test the received resources</i>	8	12		10
	PC5. examine the BMS apparatus to ensure they are not physically damaged	2	1		2
	PC6. test the BMS apparatus to ensure the correct functioning	2	1		2
	PC7. report any issues identified with BMS apparatus promptly to the relevant personnel/ supplier	2	2		2
	PC8. co-ordinate with the relevant personnel/ supplier to get a timely replacement of damaged/ faulty components	1	4		2
	PC9. maintain the record of receipt/ replacement and testing of the apparatus	1	4		2
	<i>Prepare for installing the BMS</i>	12	16		12
	PC10. check that all the civil works are completed in the building and necessary approval/ clearance is obtained before starting the installation process	2	2		2
	PC11. prepare the circuit diagram/ shop drawing/ as-built drawings for the installation of BMS in the building	2	2		2
	PC12. check that all the outlets related to BMS are accessible and not covered by Mechanical, Electrical and Plumbing (MEP) services	2	2		2
	PC13. ensure the work area is ready and safe to start the installation of BMS systems	2	2		2
	PC14. plan the installation process to ensure timely completion as per the client requirements	2	2		2
	PC15. co-ordinate with the Heating, Ventilation and Air- conditioning (HVAC) installation technician for the installation of HVAC equipment as per the BMS installation plan and client requirements	1	2		1

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

	PC16. identify the locations for the installation of various BMS equipment/ devices such as access control, video surveillance, fire alarms, HVAC control, programmable lighting and electric power management as per the BMS installation plan	1	2		1
	PC17. prepare various equipment for installation as per the manufacturer's instructions		2		
	NOS Total	30	40		30
ELE/N7206: Carry out the installation of BMS	<i>Install conduits and carry out cabling</i>	4	4		4
	PC1. install Polyvinyl Chloride (PVC)/ Galvanized Iron (GI) conduits between the field devices and the control panel as per the plan	2	2		2
	PC2. carry out wiring to connect all the field devices as per the approved BMS point schedule, wiring schedule and schematic diagrams	2	2		2
	<i>Install the Direct Digital Controller (DDC) with field devices</i>	4	6		4
	PC3. install the control panel with the required power supply at the selected location as per the approved shop drawings	1	1		1
	PC4. install and terminate the temperature sensor, humidity sensor, motorized damper actuators for HVAC equipment as per the manufacturer's instructions	1	1		1
	PC5. install and terminate the CHW temperature sensor, pressure sensor and flow sensors for CHW pipes as per the manufacturer's instructions	1	1		1
	PC6. connect all the field devices as per the approved BMS point schedule, wiring schedule and schematic diagrams	1	1		1
	PC7. install and connect the field devices such as outside air humidity sensor, water level sensor, staircase pressurization sensor as per the approved BMS system		1		
	PC8. install the VFD's inside AHU control panels and make the required cable connections as per the approved schematic diagrams		1		
	PC9. install the plumbing system including the water booster pump sets, fire pump sets, water calorifier and pump from the DDC panel, as per the system's requirements				
	PC10. carry out terminations at field ends as per the manufacturer's recommendations				
	PC11. carry out control cabling for DDC control panels through GI conduit or GI trunking above the false ceiling as per approved shop drawings, schematic drawings				
	PC12. label all the control wires with related identifications and connect as per the approved data point schedule				
	<i>Install the central peripherals</i>	4	4		4
	PC13. carry out bus loop wiring from the Central Controller to all the Variable Air Volume (VAVs) and DDC as per the approved schematic drawings	1	1		1
	PC14. install the pre-assembled peripherals with controller s hubs in the BMS control room	1	1		1
	PC15. carry out wiring between the central peripherals and the low current systems as per the approved shop drawing	1	1		1
	PC16. install the central peripherals such as the computer, printer, monitor as per the approved BMS system and shop drawings	1	1		1
	<i>Install the motion sensors</i>	2	2		4
	PC17. identify the locations for installing motion sensors as per the BMS plan	1	1		1

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

	PC18. set up the mounting brackets at the identified locations	1	1		1
	PC19. install the motion sensors as per the manufacturer's instructions				1
	PC20. connect the motion sensors for BMS digital control				1
	<i>Install the duct air temperature sensor and duct temperature/ humidity sensor</i>	4	6		4
	PC21. identify the location of the duct air temperature and duct temperature/ humidity sensor as per the approved shop drawings	1	1		1
	PC22. drill holes of the recommended diameter using a hole saw cutter and set up the mounting flanges	1	1		1
	PC23. insert and install the duct air temperature sensor and duct temperature/ humidity sensor on the mounting flanges	1	1		1
	PC24. ensure the duct temperature/ humidity sensor is mounted on the middle of the duct wall and the sensing element is diagonally bent across the cross- section of the duct	1	1		1
	PC25. set up the end of the sensing element using the collar provided with the sensor				
	PC26. ensure that the sensing element does not touch the duct wall				
	<i>Install the water differential pressure sensor</i>	2	4		4
	PC27. install the water differential pressure sensor below the pressure measuring points using the GI mounting bracket provided with the sensor	1	1		1
	PC28. ensure the surface of the installation of the sensor is vibration-free i.e. not on the surface of any equipment with moving parts.	1	1		1
	PC29. carry out drilling of holes of the recommended diameter at the bottom of the pipes for pressure tapping		1		1
	PC30. use the standard fittings supplied with the sensor to make connections		1		1
	PC31. connect the tapping point to the sensor using the copper capillary tube supplied with the sensor				
	<i>Install the air differential pressure sensor</i>	2	2		1
	PC32. mount the air differential pressure sensor on the duct wall using fasteners supplied with the sensor	1	1		1
	PC33. install the sensors using GI mounting bracket provided with the sensor	1	1		
	PC34. install duct probes in the suction and discharge side of the fans				
	PC35. connect the probes to the pressure sensor using the plastic tubing provided with the sensor				
	<i>Install the immersion water temperature sensor</i>	4	4		2
	PC36. install the thermowell in the chilled water pipeline and temperature sensor inside the thermowell	1	1		1
	PC37. install the immersion water temperature sensor as per the approved shop drawings and manufacturer's recommendations.	1	1		1
	PC38. ensure the stem length is completely immersed in chilled water and the cable entry to the sensor is not from the top of the sensor	1	1		
	PC39. apply seal on the socket and sensor threads using Teflon tape	1	1		
	<i>Install the smoke detectors in AC ducts</i>	2	4		1
	PC40. drill mounting holes as per the manufacturer's recommendations for duct housing and to insert air sampling and exhaust tubes	1	1		1

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

	PC41. carry out the wiring for detector connection as per the approved shop drawings	1	2		
	PC42. install the smoke detector with the base unit inside the smoke chamber using the adopter plates		1		
	<i>Install the butterfly valves</i>	2	4		2
	PC43. install the butterfly valves in a sandwiched position using appropriate flanges	1	1		1
	PC44. install actuators after installing and insulating the valves	1	1		1
	PC45. ensure the valve actuators are not installed upside down		1		
	PC46. maintain the other actuators in the position recommended by the manufacturer		1		
	PC47. connect the two-port valves to the piping using threaded fittings or flanges depending upon the pipe diameter				
	NOS TOTAL	30	40		30
ELE/ N7208: Carry out commissioning and testing of BMS	<i>Carry out pre-commissioning of BMS</i>	5	10		5
	PC1. ensure that the installation of all BMS components is complete, as per with the approved shop drawings and manufacturer's recommendations	1	1		1
	PC2. check that mechanical and electrical installation inspection recommendations are incorporated, ensuring no damage during mechanical completion and pre-commissioning	1	1		1
	PC3. replace any damaged components as per the SOP	1	1		1
	PC4. ensure all the relevant systems are pre- commissioned and commissioned as standalone systems	1	1		1
	PC5. check all peripheral devices are mounted and connected	1	1		1
	PC6. check all mechanical installations for the correct location and application		1		
	PC7. check all the cables are connected correctly inside the control panels/ DDC controllers and to the peripheral devices		1		
	PC8. check the control panel input terminals for interference voltages using an AC range voltmeter		1		
	PC9. ensure all Fan Coil Unit (FCU) controllers are installed and connected via communication bus		1		
	PC10. ensure the installation of all the sensors, DP switches, valves is completed both mechanically and electrically		1		
	PC11. test all control cables point to point using a multimeter				
	<i>Carry out commissioning of DDC panels</i>	5	5		5
	PC12. check the DDC panels have the correct power supply, ensuring personal safety	2	2		2
	PC13. install the DDC controller software for correct automation of DDC, as per the instructions included with the licensed software	1	1		1
	PC14. set the controller address, date and time and check for any system alarms	1	1		1
	PC15. connect the field wiring at DDC controller	1	1		1
	<i>Carry out commissioning of the Fan Coil Unit (FCU)</i>	5	5		5
	PC16. check for 240Vac at Miniature Circuit Breaker (MCB) or spur socket as applicable	1	1		1
	PC17. check the status of the LEDs for communications after switching on the power supply module and check for any alarm	1	1		1

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

	PC18. check that the network communication link is up between the BMS servers, workstations, DDC Panels, LON to IP converters (LIP) and Building Automation and Control Network (BACnet) controllers	1	1		1
	PC19. check the values displayed on the graphics screen and confirm that they are linked to the points of concerned plant as per the DDC I/O testing and commissioning check list	1	1		1
	PC20. test that changes occur in field as per the sequence of operation and the changes are displayed correctly on the graphics screen	1	1		1
	<i>Test the digital and analogue inputs and outputs</i>	5	10		5
	PC21. check all the Digital Inputs (DI) and Digital Outputs (DO) cables coming from field are volt free	1	1		1
	PC22. connect each pair of field instrument cable at the appropriate terminals as per the panel wiring termination drawing	1	1		1
	PC23. shorten and disconnect the wires at the field end and check for appropriate LED status at the DI module	1	1		1
	PC24. change the Hand-Off-Auto selector switches for all the equipment to auto position	1	1		1
	PC25. connect all cables of field instruments for analogue inputs/ outputs at the appropriate terminals as per the panel wiring termination drawing	1	1		1
	PC26. check for availability of 24Vac at each valve motor and field instrument		2		
	PC27. connect all cables of field instruments for analogue inputs/ outputs at the appropriate terminals as per the panel wiring termination drawing		3		
	<i>Test the communication link, printer and alarms</i>	5	5		5
	PC28. check that the communication link is up between the servers/ workstations and printers	1	1		1
	PC29. check the drivers are correctly installed as per the manufacturer's instructions	1	1		1
	PC30. test each alarm in the system and validate that the system generates the appropriate alarm message, the message appears at workstations and printers, and any other related actions occur as defined	3	2		2
	<i>Test the third-party system interface connectivity</i>	5	5		5
	PC31. match the values on the BMS graphics and on the third party system display for different parameters in real time after the third party systems are configured	1	1		1
	PC32. check and verify the sequence of operations according to the Sequence of Operation Manual after all field cables are verified and checked	1	1		1
	NOS TOTAL	3	3		3
	<i>Carry out repair and maintenance of BMS field devices</i>	8	12		8
	PC1. test the valve actuators, damper actuator, sensors, transducers, high-low limit thermostats, frost thermostats, pressure switches, control valve, relays, emergency stop button and fire/ smoke shut-down, the shut-off operation of spring return actuators and Digital Input and Output (I/O) for the correct functioning down, the shut-off operation of spring return actuators and Digital Input and Output (I/O) for the correct functioning	1	1		1
	PC2. check the field devices for wear and tear or damage	1	1		1
	PC3. check the BMS is connected with the control system and is online	1	1		1

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

ELE/N7207: Carry out repair and maintenance of BMS	PC4. check repair and maintenance needs of the BMS control system	1	1		1
	PC5. check the motion sensors are working as expected	1	1		1
	PC6. clean the valve actuators, damper actuators and sensors	1	3		1
	PC7. re-calibrate all sensors, transducers, valve start points and actuator travel times as per the requirement	1	1		1
	PC8. replace the worn out or damaged field devices as per the Standard Operating Procedure	1	1		1
	PC9. carry out maintenance of the motion sensors or replace them as required		1		
	PC10. carry out control panel modifications, upgradation and installations as required		1		
	<i>Carry out repair and maintenance of electrical panels</i>	10	10		10
	PC11. examine the panel exterior for signs of damage	1	1		1
	PC12. check the tightness of all the electrical terminations	1	1		1
	PC13. check the integrity of power cabling insulation	1	1		1
	PC14. check settings, ratings and operation of protective devices such as overloads, residual current devices, circuit breakers and fuses	1	1		1
	PC15. check for signs of overheating of components such as contactors, cables, connectors, as well as the internal temperature within the panel	1	1		1
	PC16. check and re-torque the busbar nuts and bolts	1	1		1
	PC17. inspect the transformers and power supplies for wear and tear or damage	1	1		1
	PC18. check the panel is correctly earth-bonded	1	1		1
	PC19. ensure main door electrical isolator is engaged and operational	1	1		1
	PC20. ensure ventilation fans and grilles are functional and clean	1	1		1
	PC21. ensure the isolators, relays, contactors and starters are functioning correctly and free from pitting				
	PC22. ensure the incoming power supply voltages are within the prescribed limits				
	PC23. ensure the cleanliness of panel and components and risk of ingress of dirt or moisture is minimized				
	PC24. ensure status indicators on all panels are functional				
	<i>Manage the BMS helpdesk, complaints and requests</i>	8	12		8
	PC25. manage the BMS help desk, providing a central point for all the BMS-related requests/ complaints	2	2		2
	PC26. ensure closure of BMS-related requests/ complaints with timely resolution	2	2		2
	PC27. direct the BMS complaints requiring vendor attention to the concerned vendor promptly	2	4		2
	PC28. escalate the unresolved complaints to the relevant authority as per the escalation matrix	2	4		2
	<i>Maintain the records</i>	4	6		4
	PC29. maintain the logs of calls reporting any issues with the BMS	1	1		1
	PC30. maintain and update documents related to BMS room, device hosting and its maintenance	1	1		1

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

	PC31. maintain records and logs regarding the building temperatures, energy consumption, control panel readings, issues encountered and the steps taken to correct the problem, etc.	1	2		1
	PC32. prepare the daily/ weekly/ monthly Management Information Systems (MIS) report regarding the requests/ complaints received and share with the relevant authority	1	2		1
	NOS TOTAL	30	40		30
DGT/VSQ/N0102 - Employability Skills (60 hours)	<i>Introduction to Employability Skills</i>	1	1	-	-
	PC1. identify employability skills required for jobs in various industries	-	-	-	-
	PC2. identify and explore learning and employability portals	-	-	-	-
	<i>Constitutional values – Citizenship</i>	1	1	-	-
	PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
	PC4. follow environmentally sustainable practices	-	-	-	-
	<i>Becoming a Professional in the 21st Century</i>	2	4	-	-
	PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
	PC6. practice the 21st Century Skills such as Self- Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
	<i>Basic English Skills</i>	2	3	-	-
	PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
	PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
	PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
	<i>Career Development & Goal Setting</i>	1	2	-	-
	PC10. understand the difference between job and career	-	-	-	-
	PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
	<i>Communication Skills</i>	2	2	-	-
	PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
	PC13. work collaboratively with others in a team	-	-	-	-
	<i>Diversity & Inclusion</i>	1	2	-	-
	PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	2	3	-	-
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	3	4	-	-
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-
<i>Entrepreneurship</i>	2	3	-	-
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
<i>Customer Service</i>	1	2	-	-
PC26. identify different types of customers	-	-	-	-
PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship & Jobs</i>	2	3	-	-
PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC31. apply to identified job openings using offline/online methods as per requirement	-	-	-	-
PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
Total Marks	20	30	-	-
Grand Total	140	190	00	120

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.

Mention the detailed assessment strategy in the provided template.

1. Assessment System Overview:
 - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
 - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
 - Assessment agency deploys the ToA certified Assessor for executing the assessment
 - SSC monitors the assessment process & records
2. Testing Environment:
 - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
 - Check the duration of the training.
 - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
 - 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.
 - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
 - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
 - Check the availability of the Lab Equipment for the particular Job Role.
3. Assessment Quality Assurance levels / Framework:
 - Question papers created by the Subject Matter Experts (SME)
 - Question papers created by the SME verified by the other subject Matter Experts
 - Questions are mapped with NOS and PC
 - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
 - Assessor must be ToA certified & trainer must be ToT Certified
 - Assessment agency must follow the assessment guidelines to conduct the assessment
4. Types of evidence or evidence-gathering protocol:
 - Time-stamped & geotagged reporting of the assessor from assessment location
 - Centre photographs with signboards and scheme specific branding
 - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
 - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos
5. Method of verification or validation:
 - Surprise visit to the assessment location
 - Random audit of the batch

<Ratified in 43rd NSQC Meeting & Dated: 08/05/2025>

- Random audit of any candidate
- 6. Method for assessment documentation, archiving, and access
 - Hard copies of the documents are stored
 - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
 - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

On the Job:

1. Each module (which covers the job profile of Building Management System Service Engineer) will be assessed separately.
2. The candidate must score 50% in each module to successfully complete the OJT.
3. Tools of Assessment that will be used for assessing whether the candidate is having desired skills and etiquette of dealing with customers, understanding needs & requirements, assessing the customer and perform Soft Skills effectively:
 - Videos of Trainees during OJT
 - Answer Sheets of Question Banks
 - Assessing the Log Book entries of Trainees at Employer location
 - Employer Performance Feedback.
4. Assessment of each Module will ensure that the candidate is able to:
 - Understand the importance of understanding production requirement.
 - Understand practical aspect of process used on Assembly line.
 - Basic health and safety practice.

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

Glossary

Term	Description
National Occupational Standards (NOS)	NOS defines the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
Qualification	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
Qualification File	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.
Long Term Training	Long-term skilling means any vocational training program undertaken for a year and above. https://ncvet.gov.in/sites/default/files/NCVET.pdf