सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
DEVELOPMENT COMMISSIONER
MINISTRY OF MICRO, SMALL & MEDIUM ENTERPRISES
MSME TECHNOLOGY CENTRE

QUALIFICATION FILE

SR. TECHNICIAN -MACHINE MAINTENANCE AND AUTOMATION

☒Short Term Training (STT) ☐ Long Term Training (LTT) ☐ Apprenticeship

☐ Upskilling ☐ Dual/Flexi Qualification ☐ForToT☐ For ToA

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

NCrF/NSQF Level: 4.5

Submitted by:

MSME TECHNOLOGY CENTRE

O/o DC MSME, Ministry of Micro, Small and Medium Enterprises

Govt. of India

A-Wing, 7th Floor, Nirman Bhawan, Maulana Azad Road

New Delhi-110108

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Email-msmetcab@gmail.com

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Section 1: Basic Details

1.	**Qualification Name**	**SR. TECHNICIAN -MACHINE MAINTENANCE AND AUTOMATION**	
2.	**Sector/s**	**Capital Goods & Manufacturing**	
3.	**Type of Qualification: ☒ New ☐ Revised ☐ Has Electives/Options ☐OEM**	**NQR Code & version of existing/previous qualification:** *(change to previous, once approved)* **QG-4.5-CG-02409-2024-V1-MSME**	**Qualification Name of existing/previous version:** **Advance Diploma in Machine Maintenance and Automation (ADMMA)**
4.	**a. OEM Name** **b. Qualification Name** (*Wherever applicable)*	**NA** -	
5.	**National Qualification Register (NQR) Code&Version** (*Will be issued after NSQC approval)*	QG-4.5-CG-02409-2024-V1-MSME	**6. NCrF/NSQF Level: 4.5**
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**	This qualification contain various module for the job role Sr, Technician (maintenance) in which students tend to get excellent career opportunities in the field of Machine Maintenance and shall be able to : • Upgrade professional skills of the learner to deal with technological change. • Can perform maintenance activities for Tool Room machines and equipment's in MSMEs • competent to get an employment in Engineering/ Manufacturing industries as per the requirement of MSMEs	

9. Eligibility Criteria for Entry for Student/Trainee/Learner/Employee

a. Entry Qualification & Relevant Experience:
Qualification &Relevant Experience in the field of Electrical, Electronics, Mechatronics, Mechanical & its Equivalent

b. Age: 17 years

S. No.	Academic/Skill Qualification (with Specialization - if applicable)	Required Experience (with Specialization - if applicable)
2	Completed 3-year diploma after 10th	Nil
3	Pursuing 3rd year of 3-year diploma after10th and continuing education	Nil
4	Previous relevant Qualification of NSQF Level 4 in the field of Machine Maintenance & Automation.	1.5 year relevant experience
6	2 year ITI in relevant Trade	1 year relevant experience

10. Credits Assigned to this Qualification, Subject to Assessment *(as per National Credit Framework (NCrF))*

20

11. `Common Cost Norm Category (I/II/III) *(wherever applicable)*: **I**

12. Any Licensing requirements for Undertaking Training on This Qualification *(wherever applicable)*

NA

13. Training Duration by Modes of Training Delivery *(Specify **Total Duration** as per selected training delivery modes and as per requirement of the qualification)*

☐**Offline** ☐**Online** ☒**Blended**

Training Delivery Modes	Theory (Hours)	Practical (Hours)	OJT Mandatory (Hours)	OJT Recommended (Hours)	Total (Hours)
Classroom (offline)	75	300	120	-	495
Online	105	-	--	-	105
Total	180	300	120		600

(Refer Blended Learning Annexure for details)

14. Aligned to NCO/ISCO Code/s *(if no code is available mention the same)*

3115.01(Maintenance Technician)

15. Progression path after attaining the qualification *(Please show Professional and Academic progression)*

Professional / Career Progress: Supervisor

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**	**Seats are reserved as per government Norms.**	
20.	**Are Greening/ Environment Sustainability Aspects Covered** *(Specify the NOS/Module which covers it)*	**☒Yes ☐No** **The said aspect is covered in the module name Employability skills**	
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: Sh. Vijay Mahipatrao Bankar** **Contact No. +0755 3501078** **Email-msmetcab@gmail.com**	
23.	**Final Approval Date by NSQC: 30/04/2024**	**24. Validity Duration: 3 years**	**25. Next Review Date: 30/04/2027**

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.	Demonstrate the Basic Machine Operation	**MSME/ADMMA/01 & Version 1.0**	Non-Core	4.5	2	30	30	-	-	60	100	100	-	-	200	
2.	Maintenance of Hydraulics & Pneumatics Components.	**MSME/ADMMA/02 & Version 1.0**	Non-Core	4.5	3	30	60	-	-	90	100	100	-	-	200	
3.	Create & Modify the Electrical circuit diagram using CAD software	**MSME/ADMMA/03 & Version 1.0**	Core	4.5	2	-	60	-	-	60	-	100	-	-	100	
4.	Carry out Machine Maintenance activities (Electrical)	**MSME/ADMMA/04 & Version 1.0**	Non-Core	4.5	9	30	120	120		270	100	100	-	-	200	
5.	Basics of Industrial Automation	**MSME/ADMMA/05 & Version 1.0**	Non-Core	4.5	2	30	30	-	-	60	100	100	-	-	200	
6.	Employability skills	**MSME/ES/02**	Non-Core	4.5	2	60		-	-	60	100	-	-	-	100	
Duration (in Hours) / Total Marks					**20**	180	300	120	-	600	500	500	-	-	1000	

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: *(Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)*

Minimum Marks to pass Theory Exam: 40%
Minimum Marks to pass Practical Exam: 60%

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.)*

Minimum Marks to pass Theory Exam: 40%
Minimum Marks to pass Practical Exam: 60%

Section 3: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years)***(as per NCVET guidelines)*	Diploma/ Degree in Electrical Engineering or Equivalent with Practical skills and knowledge required in the relevant job role at least one level higher i.e. level 5 and above in related field and minimum 2 years of experience in Tool Room/ Technology Centre of MSME or any reputed industry will become a trainer, Or in accordance with the TOT guideline of NCVET
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Degree in Engineering (Electrical/ Instrumentation/Electronic)or equivalent with 3 to 5 years of experience in Electrical MC maintenance / Industrial Automation/ Training/ Department from Tool Room/ Technology Centre of MSME or any reputed industry will become as a Master Trainer, Or in accordance with the TOT guideline of NCVET
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**	Yes

Section 4: Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Diploma/Degree in Engineering (Electrical/ Instrumentation/Electronic)or equivalent with 3 to 5 years of experience in Electrical MC maintenance / Industrial Automation/ Training/ Department from Tool Room/ Technology Centre of MSME or any reputed industry . Only (TOA) certified assessors will be able to conduct the assessments.
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Degree in Engineering (Electrical/ Instrumentation/Electronic)or equivalent with 5 years of experience in Electrical MC maintenance / Industrial Automation/ Training/ Department from Tool Room/ Technology Centre of MSME or any reputed industry .
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Post Graduate in the relevant discipline with minimum 5 years of experience in Electrical MC maintenance / Industrial Automation/ Training/ Department from Tool Room/ Technology Centre of MSME or any reputed industry.
4.	**Assessment Mode***(Specify the assessment mode)*	**Blended Type (Online + Offline)**
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 ofthe needfor the Qualification

Provide Annexure/Supporting documents name.

1.	**Latest Skill Gap Study (not older than 2 years)(Yes/No): Yes,** India Skills Report 2023, " Roadmap to India's Skills and talent Economy 2030"
2.	**Latest Market Research Reports or any other source (not older than 2years) (Yes/No):Yes,** "Engineering and capital goods industry" (Feb-2023) by India Brand Equity Foundation –IBEF (Trust established by the Department of Commerce, Ministry of Commerce and Industry, Government of India
3.	**Government /Industry initiatives/ requirement (Yes/No):** Yes
4.	**Number of Industry validation provided: 57**
5.	**Estimated nos. of persons to be trained and employed: - 3000 /Year**
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** *Yes* If "No", why:

7.	**Latest Skill Gap Study (not older than 2 years)(Yes/No):**yes
8.	**Latest Market Research Reports or any other source (not older than 2years) (Yes/No):**yes"Engineering and capital goods industry" (Feb-2023) by India Brand Equity Foundation –IBEF (Trust established by the Department of Commerce, Ministry of Commerce and Industry, Government of India.
9.	**Government /Industry initiatives/ requirement (Yes/No):**NO
10.	**Number of Industry validation provided:**30
11.	**Estimated nos. of persons to be trained and employed:**25
12.	**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)*	*Annexure-I*
2.	**Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)*	*Annexure-II*
3.	**Annexure:** Industry Validations Summary	*Annexure-III*
4.	**Annexure:** Training & Employment Details	*Annexure-IV*
5.	**Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is "Blended Learning")*	*Annexure-V*
6.	**Annexure:** Detailed Assessment Criteria *(Mandatory)*	*Annexure-VI*
7.	**Annexure:** Assessment Strategy *(Mandatory)*	*Annexure-VII*
8.	**Annexure:** Acronym and Glossary *(Optional)*	*Annexure- VIII*
9.	**Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification has multiple Entry-Exit)*	*NA*
10.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	*Annexure- IX*
11.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	*This aspect mentioned in point no. 15*
12.	**Supporting Document:** Occupational Map *(Mandatory)*	*Annexure-X*
13.	**Supporting Document:** Assessment SOP *(Mandatory)*	*Annexure- XI*
14.	Any other document you wish to submit:	*NA*

Annexure -I: 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	• Concept of maintenance process specifically maintenance, repair and automation of different electrical appliance/machines such as home appliances, motor,pump,tool room machines,lathe,Grinding,Milling,CNC, Bearing,Compressor,Powerpack etc.	• Job holder is expected to executethestudy of electrical symbols & drawings as SLDandanalysisprocessrequiredforvariousElectricalEquipment,theirworkingprinciples in various types of loadconditionswhichrequireswelldevelopedknowledgeinstudyandanalysisunderdifferentconditions. • The Job Role also involves study and understands the drawing and selects optimum Machining technique for him and modify/edit the Program as per requirement & Can perform the daily machine maintenance activities. • The trainees also canmonitortheconditionofAutomation devices as PLC, Hydraulic & pneumatic components & processand solve the fault found if anywhich requires high depth of skillinthroughthisqualification. • The job role after attaining this qualification *"Advanced Diploma in Machine Maintenance and Automation (ADMMA)"* is for Machine maintenance, work with PLC, SCADA, and Hydraulic & Pneumatic well familiar environment within the given time frame so as to maintain the maintenance cost involved. • Hence the qualification is kept atlevel4.5 aspertheprocessis Concerned.	4.5

Professional and Technical Skills/ Expertise/ Professional Knowledge	• Acquire skills of maintenance & automation Programming as per engineering standards & prepare the SLD drawing of the electrical panels for wiring with the help of E CAD software's within the drawing standards. • Acquire skills of measurements techniques of different electrical quantities.	• Exposure toPLC, SCADA, HMI, ECAD, Pneumatic & Hydraulic, Maintenance Tools. Observe machine operation to verify accuracy of machine settings and to detect malfunctions or any electrical fault of the machine, using measuring instruments such as voltmeter and clamp ammeter, multimeters. • Learner shall apply his/her comprehensive knowledge with clear context with a broad concept in general Machining Maintenance, Automation processes in Industry, Electrical Panel drawing& design, CNC electrical maintenance, fundamental knowledge of working principal of CNC Machine. • The Learner also has the field of knowledge on the maintenance techniques and specification of electrical machines for which need to be generated with stipulated time.	4.5
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	Understand Personal Strengths \ Value ,Digital Literacy, Money Matters and Preparing for Employment & Self Employment	Learner can Develop communication competence, report writing skills & preparation of Resumes or Curriculum Vitae, Learner can be able to Interact effectively with co-workers and can apply the Engineering Ethics and Human Values at workplace. Leaner can understand the basic process of becoming an entrepreneur & start up and can get benefits from various government schemes applicable.	4.5
Broad Learning Outcomes/Core Skill	•Acquire skills to Calculate technological data for Maintenance and Automation .Prepare Maintenance plan for various machines & industrial process. •Implementation of the health and safety practices, Maintaining 5's at work place. •Maintain & prepare reports as per standard / check list.	Learner shall work in a team where he/she shall gather accurate information on machining concept and requirements and communicate clearly about the work requirement to the group members through written / verbal. As per organizational standard. Ensure compliance with quality standards, policies and procedures including health and safety. Immediately report problems/failures that may impact on the machine/process to the superior staff.	4.5

Responsibility	Responsible for own work and learning as well as for the subordinates & Takes complete Responsibility for deliveryand quality of own workand output.	Learner is expected to perform the task as per given instructions, taking responsibility of proper execution of the program generated and its actions for the operation, quality and accuracy of the work. Electrical machine maintenance & Automation works independently and takes responsibility fully for own work, he/she is expected to have openness to learning, ability to plan and organize own work and identify and solve problems in the course of working. Understanding the need to take initiative and manage self-work and group tasks to improve efficiency and effectiveness	4.5

Annexure-II: Tools and Equipment(Lab Set-Up)

List of Tools and EquipmentBatch Size: 20

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1	Conventional Milling		2
2	Conventional Turning		2
3	Conventional Grinding		2
4	CNC Milling		2
5	CNC Turning		2
6	CNC Simulator		20 seat
7	PLC Kit		4
8	HMI		4
9	Electrical Wiring Board		4
10	Sensor Simulation kit		2
11	Electrical Machines (AC&DC)		5
12	Bearing Trainer Kit		2
13	Electrical Safety/MCB Demonstrator Kit		2
14	Electrical Workbench		1
15	Electronics Workbench		1
16	Motorized Megger		1
17	Wattmeter Kit		1
18	Three Phase IM Trainer Kit		2
20	Battery Charger		5
21	Dc Power Supply Kit		5
22	Single Phase Transformer Kit		5
23	Oil Testing Kit		1
24	MCB &HRC Fuse Testing Kit		1
25	Dc Regulated Dual Power Supply		2

26	Single & Three Phase Resistive Load		2
27	Three Phase Variable Auto T/F		3
28	Dc Series Machine Lab Kit		1
29	Dc Integrated Machine		1
30	VFD(AC&DC)		1
31	Power pack		1
32	Compressor		1
33	Pneumatic Trainer Kit		1
34	Hydraulic Trainer Kit		1
35	CAD Software- Electrical CAD		20 Seats
36	PLC-PLC Software		20 Seats
37	SCADA-SCADA & HMI Software		20 Seats
38	VFD-VFD software		20 Seats
39	Hydraulic & Pneumatic Simulator Software		20 Seats
40	**Measuring Instruments: mustimeters,** voltmeter, ammeter, frequency meter, power factor meter, watt meter, lux meter, tacho meter, clamp meter, anemometer, flux meter.		2 set each
41	**Others Miscellaneous items for workshop / Lab: Industry** hand gloves, Apron, Safety goggles, First aid kit.		1 set
42	**General Equipment for Classroom**: White Board, Smart Board, Duster, Marker, Multimedia /LCDProjector, Audio Video Aids, Pen drive and Practice exercise etc.,.		1 set

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	MONIKA ENGINEERS	VIkasBatta	Proprieter	INDUSTRIAL ESTATE, LUDHIANA, 141003	9727846445	vikas@monikaengineers.co.in	
2	CHETNA HI TECH ENGINEERS	Kuldeep Singh	Administrato	Behind Veer Palace, Ludhiana, Punjab India 141010	8872343999	chetnahitechenqineers@yahoo.co.in	
3	Originative Solutions Network Pvt Ltd	AMITOJ SINGH	DIRECTOR	CHD Road,Ludhiana,Punjab (India)-141015	987809861 2	md.osnpl@gmail.com	
4	S S ENGG. SERVICES	SimranpreetKaUR	Administrato	Chandigarh Road, Ludhiana-141010	9915028585	ssengg83@gmall.com	
5	AXOM Farm Machinery Pvt. Ltd.	Swakshar Chakravarty	Managing Director	60, MRD Road, Guwahati, Assam - PIN 781020	7086099788	swakshar@hotmail.com	
6	ADD CONSTRUCTION	DURKUV HATB	PARTNER	College Nagar, Abhoypur, North Guwahati Guwahati-781031 (Assam)	9435119042	addconstruction38@gmail.com	
7	The Supreme Industries	Mr. SiromaniRajkhowa	PLANT HEAD	E. P. I. P. Complex,	+91 7578-	siromani_rajkhowa@supreme.co.in	

	Limited.			Amingaon.	012031		
8	JAY AMBAY POLYMERS	NAGEUDU LIALODIS	PROPRIETER	ROAD FANCY,GUWAHATI-781001			
9	CAMA ELECTRICALS PRIVATE LIMITED	Nishad Azmi Bokth	H.R Manager	"2nd Floor, E1 and E2 Block, Brahmaputra Industrial Park, Plot No 21,	7099065843	HR@HMCASSAM.IN	
10	Unique Enterprises	Partha Roy	Proprieter	Changsari, Sila, Amingaon, North Guwahati, Kamrup, Assam,"	98741 27130	partha@enterprisesindia.com	
11	SHIV ENGINEERS	S.Maity	Proprieter	.S.- Dasnagar, Howrah-711 13	7980872335	shivengineer1980@gmail.com	
12	SK Synthetics	MANISH JAIN	CEO	BALITIKURI, HOWRAH - 711 113	9331022044	SKSYNTHETICS@HOTMAIL.COM	
13	A. C. STEEL TRAIDING CORPORATION	A. C. JASWAL	PROPRIETER	40 STRAND RD,3RD FLOOR KOLKATTA-700001	9830073612	ACSTEEL_2004@YAHOO.CO.IN	
14	Arrow Aviation	Sanjib De	Quality Managaer	BELILIOUS RD,LOAN BAZER,ROOM-141,142, HOWRAH-711101	9831092407	qualitymanager@arrowaviation.com	
15	CALCUTTA TECHNO HEATERS (INDIA) PVT. LTD	M. K. SAHA	DIRECTOR	53/1/3, Hazra Road, Kolkata - 700019	9831086241	MKSOCT55@GMAIL.COM	
16	MAX MILL Technologies	PRADEEP SHARMA	MANAGER	22A, DUM DUM ROAD, KOLKATA - 700 002	7003462714	maxmilltechnologies@gmail.com	
17	SPECIAL ENGINEERING SERVICES LTD.	ASHIM GANGULY	JR. Factory Manager	172/1,Ashokgarh,Dunlop, Baranagar, Kolkata-700108	913325578434	sescatcn@cal2.vsl.net.in	
18	ABHAYA PRECISION INDUSTRIES PVT LTD	Abhesek Ghosh	Managing Director	16, COSSIPORE ROAD, KOLKATA-700 002	9831617997	MAIL@ABHAYAMD.COM	
19	SATYANARAYANENGINEERINGWORKS	NILANGSHU GHARUI	MANAGER	70/2,YOURIBANI LANE,KOLKATTA-04	7980278984	DATYANARAYANEGG@GMAIL.COM	
20	SHREE RADHA KRISHNA INDUSTRIES	MANI BHUSHAN SINGH	Proprieter	SHANPUR, DAONAGAR, HW-711105	9883368597	SHREERADHAKRISHNA21@GMAIL.COM	
21	NSCB AVIATION (P) LIMITED	SUBHASISH HALDER	DIRECTOR	1/1d, Joy Krishna Ghosal Road, Aríadaha, Rathtala, Kolkata-700 057	8910627096	subhasish.haldar@nscbaviation.com	
22	SSK PRECISION COMPONENTS Mfg. Put. LTD.	SOUVIK SINHA	DIRECTOR	34, Scout Para, Ganga Nagar, Kolkata 700132	9831065851	SSKCNC@REDIFFMAIL.COM	
23	ALLWIN UNITED ASSOCIATION PVT.LTD	MI PANKAJ	DIRECTOR	ALLWIN UNITED ASSOCIATION	7588537412	CONTACT@TECHNOCADDAPL.COM	

				PVT.LIMITED			
24	MIS ANNA BLOCK BORING CENTER	MASIT KHAN	PROPRIETOR	MIS ANNA BLOCK BORING CENTER	9767375083		
25	LAXMI ENTERPRISES	RANJANA BHAYYA SAHEB PAWAR	MI.MANAGER	SAINAGAR GHANEGAON MIDC WALUJ, AURANGABAD	7387431128		
26	M/S HR INDUSTRIES	VASPUT JAUGELE	PROPRIETOR	SAJAPUR, AURANGABAD	9637384737		
27	GAYATRJ AUTO COMPONENTS, AURANGABAD	MR. RANJEET METE	MANAGER	AURANGABAD	7385613842	INFO@GAYATRIAUTO.IN	
28	SHARP TOOLS	MAHESH DORLE	SR.MANAGER		9689574563		
29	CHANCHAL ENGINEERING WORKS AURANGABAD	DRYHAEBHWAR	PROPRIETOR	AURANGABAD	9765499939	CHANCHALENGINEERINGWORKS@GMAIL.COM	
30	AKSHARA ENGINEERING WORKS	SHIVAJI GAIKWAD		WALUJ MIDC AURANGABAD	9096420857		
31	ARUSHI ENGINEERING AND BREEZING	VIJAYA PARADE	MANAGER	WALUJ MIDC AURANGABAD	9049596736		
32	SR INDUSTRIES AURANGABAD	RAJENDRA SAUDAGAR MARE	SR. MANAGER	AURANGABAD	8698145607		
33	DEVA ENGINEERING AURANGABAD	ASHOK MOTINAM VEOR	SR. MANAGER	AURANGABAD	8459567793		
34	MAULI PATTERN AURANGABAD	MR. PANCHAL	PROFESSOR	AURANGABAD	9673067755		
35	NAVARATNA INDUSTRIES			WALUJ MIDC AURANGABAD			
36	PRANAW ENTERPRISES AURANGABAD	PANDRINATH DEVKAR	PROPRIETOR	AURANGABAD	9371671146	PRANAVENT@GMAIL.COM	
37	R.P INDUSTRIES	PRASHANT PATIL	CEO	MIDC CHIKATHANA AURANGABAD	8007222251	PRASHANTPATIL@GMAIL.COM	
38	TECHNO MOULD SOLUTION	MR. PANDA	PROPRIETOR	AURANGABAD	7774077907	TECHNOMOULD.SOLUTIONS@GMAIL.COM	
39	SANJAY THCHNO PRODUCTS	HEMANT CHAUDHURY	VP-MANUFACTURING	AURANGABAD	9158898090	HEMANT.CHAUDHARI@SANJAYTECHNOPRODUCTS.IN	
40	SPECIAL PRECISION	ASHIWINI TADHAV	PROPRIETOR	AURANGABAD		SPECIALASHIWIN@GMAIL.COM	
41	PARASON MACHINERY (INDIA) PVT LTD	GHAHU	GM	AURANGABAD	9325202860	AMOIL.MOGAL@PASASEN.COM	
42	PADMA INDUSTRIES	VITTHALKADOM	CEO	MIDC AURANGABAD	9421688212	VITTHALKADOM2525@GMAIL.COM	
43	VANI ENGINEERING CO.PVT LTD	SUBH	GENERAL MANAGER	AURANGABAD	9730729991	SKAPE@GMAIL.COM	
44	GLANCE ENGINEERING - 6 PVT.LIMITED	SUBH SK	GENERAL MANAGER	CHIKALTHANA	9730729991	S.KALE@GMAIL.COM	

	CHIKALTHANA						
45	SURAJ TOOLS AND ENGINEERING WORKS	SURAJ	CEO		7447375273	SURAJTOOLS@GMAIL.COM	
46	JAI BHAVANI ENGINEERING WORKS		GENERAL MANAGER		9370251815		
47	RN INDUSTRIES		CEO	MIDC KALAGRAM AURANGABAD	9890718928	R.N.INDUSTRIES01@GMAIL.COM	
48	MADURA DIE CAST PVT LIMITD	MADHURA	CEO	SHENDRA AURANGABAD	9422204622	MADHRADIECAST@GMAIL.COM	
49	SWAGATI ENGINEERING WIS2		CEO	CHIKALTHNA,AURANGABAD	9763714369	SWAGATIENGG@GMAIL.COM	
50	SN ENGINEERINGWORKS	SNEHA	CEO	CH SAMBHAJINAGAR	9822859974	SNEHAG858@GMAIL.COM	
51	IDEAL ENTERPRISE		GENERAL MANAGER	CHIKALTHANA AURANGABAD	9763785199	IDEAL1993@GMAIL.COM	
52	INDEXABLE CUTTING TOOL	TOR	PROPRIETOR	BAJAJNAGAR,AURANGABAD			
53	INDOTURAN INDUSTRIES	USHAL SHINDE	PROPRIETOR	MIDC AURANGABAD WALUJ	9595280808		
54	CREATIVE CASTING INDUSTRIES	MR. SANJAY RANDIRE	PARTNER	K-30, MIDC WALUJ , AURANGABAD	9011001671	CREATIVECAST@REDIFFMAIL.COM	
55	PYRAMID INDUSTRIES	MR. RAJENDRA KALE	PROPRIETOR				
56	RMG INDUSTRIES	RAOUAL	CEO	MIDC AURANGABAD WALUJ	9766699611	EAJUQANDA@RMGINDUSTRIES.COM	
57	MIKRONIX GAUGES PVT LTD	MI PANKAJ	MD	B-25 MIDC , CHIKALTHANA, CH. SAMBHAJINAGAR	9822004674	MGPLAY@GMAIL.COM	

Annexure III: Training & Employment Details

Training and Employment Projections:

Year	Total Candidates		Women		People with Disability	
	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities	Estimated Training #	Estimated Employment Opportunities
23-24	200	160	50	45	0	0
24-25	250	220	60	50	0	0
25-26	300	280	70	60	0	0

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
1.1	20-21	103	103	103	91	11	11	11	9	-	-	-	-
1.1	21-22	179	179	179	168	18	18	18	15	-	-	-	-
1.1	22-23	337	337	337	315	20	20	20	16	-	-	-	-

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. Fee based Training Program under the Ministry of MSME.
2. ESDP Scheme under the Ministry of MSME.
3. PM DakshtaAurKushaltaSampannHitgrahi Yojana under M/o SJE, GOI
4. Capacity building Training program under National SC/ST Hub, M/o MSME, GOI
5. DDUGKY under the MoRD.
6. Schemes under the different state Government.

Content availability for previous versions of qualifications:

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

Languages in which Content is available:

English Only

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 with 2D and 3D animation Self-Learning Videos /Broadcasts /Mobile Learning /Curated Digital content	40:60
2	☐Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	Self-learning videos , broadcasts, mobile learning , curated digital content	40:60

3	☐Showing Practical Demonstrations to the learners	PLC simulator,HMI, electrical machines,CNC simulators/ ecad software, video content , e-resource library	100:0
4	☐Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	Electrical machines, hydraulic, pneumatic, bearing assembly, CNC Lathe & Milling Machines, Grinding Machines, Measuring, instruments, Hand Tools / ECAD Software, PLC, HMI, SCADA software.	100:0
5	☐Tutorials/ Assignments/ Drill/ Practice	Online Question Bank, Mobile Quick test app, MCQ based tests, Practical Test on Machines	40:60
6	☐Proctored Monitoring/ Assessment/ Evaluation/ Examinations	Assessment engine for Essays, Up-loadable file examinations, Mock test sessions	50:50
7	☐On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	Live Project on , automation & control ,Measuring Instruments at concern Industry/ Institution	100:0

Annexure: III 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
NOS / Module: **MSME/ADMMA/01** Maintenance of Hydraulics & Pneumatics Components.	PC.1 Explain the types of Conventional & Non-Conventional Machines, Advantages & Limitations of CNC applications. PC.2 Discuss safety precautions.Demonstrate machines. PC.3 Explain Co-ordinate systems & points mode. PC.4 Identify Cutting Tools and Tool Holders from the standard (ISO Standard) PC.5 Selection of standard tools/ cutters/Tool Holders as per requirement PC.6 Define Turning Insert Shapes PC.7 Describe Operating Conditions PC.8 Explain Work holding methods PC.9 Identify and Explain Tool holding Devices. PC.10 Discuss the need of different oils & lubricants used. PC.11 Explain different conventional machine like lathe, milling, grinding machine etc. PC.12 Describe different machine parts & accessories. Understand about the different types of operations.	-	100	-	-

	PC.13 Explain the methods of machining. PC.14 Explain different cutting techniques like milling, turning, drilling, grinding etc. PC.15 Describe different machine operations like: Plain & Step turning, Parting, Boring, Grooving, Facing, Threading, Profile, Drilling, Tapping, Reaming, Counter boring, Knurling, polishing etc. PC.16 Describe standard mathematical formulae used in calculation required for machine tool operation. PC.17 Calculations of machining parameters like cutting speed, cutting feed, depth of cut etc. PC.18 Explain CNC interpolation, open loop & close loop control systems with feedback devices PC.19 Explain Axis – Orientation PC.20 Define Work sketch and Calculation PC.21 Use appropriate sources to obtain the required information e.g. Numerical control on CNC machine, types of CNC control PC.22 Check that all the equipment is correctly connected and in a safe and usable working condition PC.23 Use codes and other references that follow the required conventions PC.24 Plan the machining activities before starting them. PC.25 Set up and check that all peripheral devices are connected and correctly operating PC.26 Confirm that the program is as per job specifications and contains all relevant information PC.27 Make sure that programs are checked and approved by the appropriate person PC.28 Save the program in the appropriate file type and location PC.29 Prepare programs, demonstrate, simulate and operate CNC lathe, machines for various machining operations. PC.30 Execute program and inspect simple geometrical forms / standard parts				

	PC.31 Explain the type of maintenance and Maintenance checklist. PC.32 Carry out Routine Maintenance activity as per standard / checklist. PC.33 Safe handling of tools, equipment & CNC Machines & Personal safety tool as per company product requirement. PC.34 Use protective clothing / equipment for specific tasks on CNC Machine				
NOS / Module : **MSME/ADMMA/02** Maintenance of Hydraulics & Pneumatics Components.	PC.1 Explain about pneumatic & hydraulic system, Advantages & Limitations of pneumatic & hydraulic system applications. PC.2 Explain about safety precaution in pneumatic operations. PC.3 Demonstrate Pneumatics Basiccontrollingequipmentand use. PC.4 Demonstrate the pressure Measurement bydifferent pressure gauges (Digital and Analog type). PC.5 Calculate the gauge pressure, atmospheric pressure, absolute pressure. PC.6 Demonstrate different parts of air generation unit. PC.7 Demonstrate different parts of air preparation unit. PC.8 Demonstrate different parts of air consuming unit. PC.9 Explain about pneumatic direction control valves. PC.10 Demonstration of DC-valves and their different actuation process. PC.11 Explain about pneumatic Flow control valves. PC.12 Demonstration of different Flow control methods. PC.13 Explain about pneumatic pressure control valves & combination valve. PC.14 Demonstration of different pressure control valves and applications. PC.15 Explain about pneumatic linear actuators and Rotary actuators. PC.16 Demonstration of different pneumatic cylinders & motor actuation. PC.17 Explain about pneumatic components symbols and pneumatic schematic control logic diagrams. PC.18 Explain about electro pneumatic system and electrical safety. PC.19 Demonstration of different electro pneumatic components as switches, relays, sensors, AC and DC supply. PC.20 Explain about electro-pneumatic component symbols and electro-pneumatic schematic control logic diagrams.	-	100	-	-

	PC.21 Demonstration of different electro pneumatic industrial control operations PC.22 Demonstration of OPC-Server communication with PC and electro-pneumatic system. PC.23 Demonstration of PLC communication with PC and electro-pneumatic system. PC.24 Explain about safety precaution in hydraulic operations. PC.25 Demonstrate hydraulics Basiccontrollingequipmentand its use. PC.26 Demonstrate the pressure Measurement by different manometers (Analog type). Calculate the hydraulic pressure. PC.27 Demonstrate different parts of hydraulic pressure generation unit. PC.28 Explain about differentfilters and their application in hydraulic system. PC.29 Explain about Hydraulic direction control valves. PC.30 Demonstration of DC-valves and their different actuation process. PC.31 Explain about hydraulic Flow control valves. PC.32 Demonstration of different Flow control methods. PC.33 Explain about hydraulic pressure control valves. PC.34 Demonstration of different pressure control valves and pressure relief valves with applications. PC.35 Explain about hydrauliclinear actuators and Rotary actuators. PC.36 Demonstration of different hydraulic cylinders& motor actuation. PC.37 Explain about hydraulic components symbols and hydraulic schematic control logic diagrams. PC.38 Explain about hydraulic components symbols and hydraulic schematic control logic diagrams. PC.39 Explain about electro-hydraulic system and electrical safety. PC.40 Demonstration of different electro -hydraulic components as switches, relays, sensors, AC and DC supply. PC.41 Explain about electro-hydraulic component symbols and electro-hydraulic schematic control logic diagrams.				

	PC.42 Demonstration of different electro-hydraulic industrial control operations. PC.43 Demonstration of OPC-Server communication with PC and electro-hydraulic system. PC.44 Demonstration of PLC communication with PC and electro-hydraulic system. PC.45 Explain about maintenance of hydraulic& pneumatic system& demonstration.				
NOS / Module : **MSME/ADMMA/03** Create & Modify the Electrical circuit diagram using CAD software	PC.1 Explain the Importance of Engineering drawing, PC.2 Explanation the scope and objective of Engineering Drawing PC.3 Demonstrate and explain drawing Standards: Size of drawing sheets – Layout of drawing sheet – Title Blocks – Types of lines – Folding of drawing sheets. PC.4 Use of dimensioning techniques according to Standard of dimensions PC.5 Demonstrate orthographic & Isometric projection by using a viewing box and a model PC.6 Use of symbol in projections -Front view, top view and side view PC.7 Demonstrate the use of Auto CAD and Auto CAD interface PC.8 Apply coordinates systems in auto CAD PC.9 Demonstrate the use of tool bars. PC.10 Create solid field area (Hatching, Gradient) PC.11 Edit objects using the object property tool bar and various methods. PC.12 Use sketch settings and Style toolbar (text style, Multileader style etc.) PC.13 Edit object using object property toolbar & various method. PC.14 Create the replica of model using copy, array command PC.15 Work with models in the modify toolbar. PC.16 Identify the appropriate Tool to create and modify the model PC.17 Change the orientation of the object by aligns, offset, rotate command PC.18 Apply standard dimension in a mechanical component. PC.19 Use of dimensioning Methods: Linear, Align, ordinates, Radius,	-	100	-	-

	Diameter, Arc length, angular etc, PC.20 Use of leader with text, block reference PC.21 Edit or modify the CAD Drawings PC.22 Use of layers Management and its applications PC.23 Apply GD& T Symbols in drawings PC.24 Develop proper drawing layout. PC.25 Use of 3D, 3D environment & toolbars.Extrude, revolve, Boolean operation , PC.26 Use of Sweep, Loft, and Press pull.3d Move, 3d Rotate, 3d Array, 3d Align. PC.27 Use of AutoCAD Electrical software Workspace Awareness, Tool Bars, Tool Pallets , PC.28 Insert component working with project manager. Overview about relay, contactor, timer and old. PC.29 Explain about drafting features-copy, move, delete, scoot, align, link component, attribute reverse/ flip component, retag and update component. PC.30 Create For/Rev Control circuit of 3ph induction motor using contactor and for/rev control circuit of 1ph dc motor using relay. PC.31 Create Star-Delta Control Circuit, Start-Delta With For-Rev Control Ckt. PC.32 Create Multibus, wire number, wire color, wire size, wire labeling, and overview on timer power ckt of F-R. PC.33 Symbol builder, cuircuit builder, icon menu wizard, power ckt of Star-Delta, Star-Delta with F-R. PC.34 Panel design of F-R, A-D, panel design of F-R with S-D,schematic and panel report generation, export data to excel format. PC.35 Use of EPLAN for power circuit, wire coloring, labeling with 2D&3D panel designing. PC.36 Develop PLC-I/O positioning, symbol macro, report generation.				

NOS / Module: **MSME/ADMMA/04** Carry out Machine Maintenance activities (Electrical)	PC.1 Explain about basic fundamental of electricity. PC.2 Explain about electrical safety rules, use of safety precaution kit and tools. PC.3 Explain the PPE in Industrial Safety. Common hand tools. PC.4 Explain Basic injury prevention, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety. PC.5 Discuss about Electrical shock and its effect, effect of electrical current on human being, method of avoiding electrical shock, first aid for victim of electric shock. PC.6 Use of various appropriate fire extinguishers on different types of fires correctly. PC.7 Explain Nature of electricity and fundamental laws. Single phase & three phase system. PC.8 Explain Electrical measuring instrument construction & working. PC.9 Demonstratemeasuringinstrumentforelectricalparameters as voltmeter, ammeter, frequency meter, power factor meter, watt meter, lux meter, tacho meter, clamp meter, anemometer, flux meter. PC.10 Explain about different types of earthings. PC.11 Demonstration of earthing test. PC.12 Demonstration of different types of electrical safety fuses. PC.13 Discuss about L.V circuit breakers. PC.14 Demonstration of different types of electrical protective device as MCB, MCCB, RCCB, ELCB, OLR, MPCB. PC.15 Explain about different types of electrical cables, specifications, selection procedure, uses, and advantages. PC.16 Demonstration of underground cable laying methods. Socketing, Glanding, Fault measuring. PC.17 Demonstration of underground cable laying methods. Socketing,	100	-	-	100

	Glanding, Fault measuring. PC.18 Explain types of maintenance, Preventive Maintenance, Corrective Maintenance, And Breakdown Maintenance. PC.19 Explain about domestic supply and appliances. PC.20 Demonstrate maintenance of Iron, Geyser, Induction Heater, Micro-Oven, Celling Fan, Grinder etc. PC.21 Explain about industrial supply and different industrial electrical loads. PC.22 Explain industrial machine maintenance, Preventive Maintenance, Corrective Maintenance and Breakdown Maintenance. PC.23 Demonstrate machine panel wiring, electrical fault finding procedures. PC.24 Demonstrate MOTOR Preventive Maintenance, Corrective Maintenance and Breakdown Maintenance. Motor meggering, overhauling. PC.25 Demonstrate PUMP Preventive Maintenance, Corrective Maintenance and Breakdown Maintenance. PC.26 Explain about different types of bearings & assembly methods. PC.27 Demonstrate bearing maintenance & assembly. PC.28 Demonstrate Hydraulic power pack, pneumatic compressor, Diesel generator maintenance. PC.29 Explain about types and activities ofplant maintenance andDocumentaryreport. PC.30 Demonstrate about PlanningSystem, spare part Inventory, qualityrequirementandawareness. PC.31 Explain about different electrical & mechanical faults in different machines. PC.32 Explain about fault finding methods, root cause analysis & troubleshoot of breakdown machines. PC.33 Demonstrate to find Source, partinventory repairing, purchasing andcauseandfactoranalysisforall machines. PC.34 Demonstrate Maintenance ofdifferent machine as: turning,milling,andgrinding,drilling,radialgrinding of different				

	manufactures. PC.35 Explain about ObjectiveofCNCmachine, machine codes, panelboardandaxishoming. PC.36 Demonstrateaboutdifferentcycleandtheiruses. PC.37 Demonstrateabout weekly, monthly CNC Preventive maintenance, Break down Maintenance. PC.38 DemonstrateMagnetismandclassification of magnets, care andmaintenance,methodsof magnetizing&magneticmaterials. PC.39 Demonstrate electromagnetism,corkscrewrule,righthandrules.Faradays laws, Lenz's law andPrincipleandApplicationofD.C.motorandgenerators. PC.40 Demonstrate Installation,testand runofanelectricDCmotors. PC.41 Demonstrate Installation,testand runof electricDCgenerator and M.G.set. PC.42 Demonstrate Principle of Single phaseand threephasemotorand itsapplication. PC.43 Install and test an electric single phase AC motors and anelectric3phasemotor byaD.O.L.starter. PC.44 Install and test an electric 3phasemotor byaStar-Delta starter. PC.45 Explain about different types of transformers, working principle, specification and calculations. PC.46 Demonstration of Shortandopencircuit testof1phasetransformer. PC.47 Demonstrate about star and deltaconversionoftransformer. PC.48 Demonstrate Power measurement by two wattmeter methodofthreephaseresistiveload&inductiveload. PC.49 Explain about different electronic components, applications and advantages. PC.50 Demonstration on different electronic component like resister, capacitor, diode, IC, transistor, SCR and its application. PC.51 Demonstrate op-amp and itsapplication. Use op-amp to design various				

	electronic circuits,identifythepins ofop-ampIC. PC.52 Demonstrate about Solderingtechnique, active, Passiveelectroniccomponents,measuringinstruments. PC.53 Demonstratethenumbersystem, logic gatesandK-Map. KnowthenumbersystemconversionandsimplifyexpressionsusingK-Map. PC.54 Analog & digital IC testing by using IC tester. PC.55 Function and working of oscilloscope and also measuring different quantities. PC.56 Demonstrate Function of frequency generator, counter & wave shaping etc.				
NOS / Module: **MSME/ADMMA/05** Basics of Industrial Automation	PC.1 Explain about basic fundamental of electricity. PC.2 Explain about electrical safety rules, use of safety precaution kit and tools. PC.3 Explain the PPE in Industrial Safety. PC.4 Explain Basic injury prevention, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety. PC.5 Demonstratemeasuringinstrumentforelectricalparameters. Use multi-meters for measurements of voltage, current& continuity. PC.6 Explain briefly types of control based on application i.e. Manual Control, Feedback Control, Sequential Control, Motion Control, and Logical Control. PC.7 Demonstrate symbols of theelectricalcomponentslikeM.C.B., Starter,Fuse,andBelletc.UseSeriesandparallelcircuitandPreparesmallcircuit. PC.8 Identifytypesofwiring,drawonelinediagramusingstandardsymbol s anddothe wiring. PC.9 Demonstratetypesofdomestic andindustrialwiring&JICsymbol,IECsymbol PC.10 Discussion of different switches: push button, selector switch, limit switch.	-	100	-	-

	PC.11 Explain briefly about types of contacts i.e. normally closed and normally closed contacts. PC.12 Identifythetypesofswitchesanddesigncontrolcircuitsfor AC &DCloads. PC.13 Demonstrate different electro-mechanical switching componentsas: relay,contactor andtimer. PC.14 Testing of Relay& contactor, identification of change over contacts as: NO- contacts, NC - contacts &common contacts. PC.15 DotheconnectionPanel board wiring ofrelayandcontactorsformotorcontrollogicas:start stop,forwardreverse. PC.16 Demonstrate Panel wiring for Inching, Latching, Start, and Stop Control Circuits for motor. PC.17 Demonstrate about differentsensors as: proximity inductive,proximitycapacitive,proximityoptical. PC.18 Identify and test the connecting terminals for input&outputsignal ofthesensors. PC.19 Dotheconnectionofsensorsfordifferent automation application logics. PC.20 Wiring and testing of control and power circuit: 3-ø star-delta starter. Electrical fault monitoring in both control circuit and power circuit. PC.21 Explain about industrial Automation, different type of automation & control, advantages & dis -advantages, area of application, Levels of automation. PC.22 Role of automation in various industrial process & future scopes. PC.23 Explain about Programmable Logic Controller (PLC), typesof PLC. PC.24 Explain about Scan cycle, Work Memory, Data memory, PLChardware modules, communication protocols and gateway. PC.25 Demonstration of PLC Hardware installation and communication. PC.26 Diagnosis of communication errors by indication and error-messages. Correction of error. PC.27 Identify of PLC Hardware and do Practice to Communicate PLC with PC/LAPTOP system Installation of PLC software &simulation.				

	PC.28 Explain about PLC-programming software& features, IEC-programming languages as LAD, FBD, and STL. PC.29 Create and test LAD, FBD, STL program using bit & block-Operands. PC.30 Demonstration on LAD, FBD, STL programming language Logic Gates, AND, OR, NANAD, NOR, XOR. PC.31 Demonstration on TIMER, COUNTER, and COMPARATOR blocks, in software. PC.32 Explain about analog control in PLC, analog sensors and Voltage control method with 0-10v dc I/O signal /Current control method with 4-20 mA DC I/O signal. PC.33 Demonstration analog signal I/O of PLCusingVoltage control method with 0-10 v DC I/O signal /Current control method with 4-20 mA DC I/O signal. PC.34 Demonstration connection of I/O field devices in signal I/O of plc. Connection of different sensors & actuators with signal modules. PC.35 Demonstration connection of remote I/O PLC with server PLC using profibus cable. PC.36 Fault analysis of Profibus / Ethernet network. PC.37 Explain about supervisory control and data acquisition system (SCADA). PC.38 Functionalities and security features in SCADA architecture. PC.39 Demonstration on installation of SCADA software and driver tools. PC.40 Create different types of SCADA projects using software. PC.41 Demonstrate about graphic designer, tag management, and communication to PLC. PC.42 Creating new projects, copy of project, activation & deactivation of project. PC.43 Use of Object Properties of Object Palette & Library. PC.44 Editing Of Static Properties Style, Flashing, and Display. Use of Standard Color Palette. PC.45 Create process picture & simulate using mimic logic boards.				

	PC.46 Demonstrate about Integrate & Configure Controls in Process Pictures. PC.47 Demonstrate about Creating an Alarm Logging screen of a process. Archiving Messages. Display Message In Run Time PC.48 Creating an Online Trend, Table Trend report. PC.49 Creating an Online Trend, Creating & Accessing Real-Time & Historical Trends. PC.50 Design PC-Based HMI Interface different field devices with SCADA system & monitoring process values. PC.51 Configuration of HMI and PLC .Upload/ Transfer programs. PC.52 Demonstration with different HMI-models as KTP, TP. PC.53 Demonstrate of connection between hard ware module & I/O field devices. PC.54 Demonstrate the Connection of multiple users with multiple PLC using Ethernet communication network (LAN). PC.55 Fault finding with indication and system messages.				

NOS / Module: **MSME/ES/02** Employability skills	PC.1 Explain the major applications of MS Office. PC.2 Explain the different types of e-commerce. List the benefits of e-commerce for retailers and customers. PC.3 Discuss how the Digital India campaign will help boost e-commerce in India PC.4 Write applications pertaining to various matters. PC.5 Explain power of positive attitude and Importance of commitment. PC.6 Explain motivation and the Ways to motivate oneself and Personal goal setting. PC.7 Explain the Effective & Level of Communication PC.8 Explain communication and Significance of technical communication? PC.9 Explain the methods of listening Skills. PC.10 Explain the differences between bio-data, CV and Resume. PC.11 Explain verbal and non-verbal Communication PC.12 Explain how to face an interview. PC.13 Explain team work, group work, team formation process PC.14 How to Minimize the team conflicts PC.15 Explain Ethics & values. PC.16 Explain the concept of entrepreneurship, and entrepreneurship v/s Management. PC.17 Explain entrepreneurial process and entrepreneurship frame work. PC.18 Role of information in opportunity recognition. PC.19 Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan. PC.20 Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement PC.21 Describe environment scanning, SWOT (Strengths, Weaknesses, Opportunities and Threats). PC.22 Explain entrepreneurial personality&traits. Barriers in entrepreneurship. PC.23 Explain importance of business model, business model analysis & the	100	-	-	-

	life cycle of the business model. PC.24 Meaning and importance of startup factors of entrepreneurship. PC.25 Explain organizational structure and forms of ownership. PC.26 Explain the process of project report preparation for setting up a new business. PC.27 Explain meaning and importance of manpower planning, financial planning, working capital, perfoma income statement, perfoma balance sheet, breakeven point. PC.28 Explain the role of various schemes and institute for self- employment i.e MSME, DIC, NSIC, SIDBI etc, PC.29 Role of financial institution to support startup. PC.30 Discuss the importance of saving money. PC.31 Discuss the main types of bank accounts. PC.32 Differentiate between fixed and variable costs. PC.33 Describe the different types of insurance products. PC.34 Discuss the main types of electronic funds transfers. PC.35 Describe concept of intellectual property rights. PC.36 Explain types of intellectual properties. PC.37 Role perspective of intellectual property concept in entrepreneurship. PC.38 Explain advantage of intellectual property rights and economic benefits.				
	Total Marks	**200**	**400**	**-**	**100**

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 are assigned to the MSME NSQF Assessment Agency via email for the assessment.
- MSME NSQF Assessment Agency sends the assessment confirmation to respective TC.
- MSME NSQF Assessment Agency deploys the certified Assessor for executing the assessment at respective TC via online / offline mode.
- MSME NSQF Assessment Agency & respective TC Internal Assessment cell monitors the assessment process & records.

2. Testing Environment:

- MSME NSQF Assessment Agency confirms the Assessment location, date and time
- For number of candidates more than 30 separate assessors are assigned for the assessment.
- MSME NSQF Assessment Agency & respective assessor confirms that the allotted time to the candidates to complete Theory & Practical Assessment is correct.

3. Assessment Quality Assurance levels/Framework:

- Each TC Submits the Question Bank for the individual subject Theory &Practice separately, submits to MSME NSQF Assessment Agency and it is verified by the MSME NSQF Assessment Agency Committee members.
- Questions are mapped to the specified assessment criteria
- All the assessors & Trainers are well qualified & trained to carry out the specified task.

4. Types of evidence or evidence-gathering protocol:

- Online Link is send by MSME NSQF Assessment Agency to respective TC & Assessor. Reporting of the assessor from assessment location is verified by the MSME NSQF Assessment Agency through the online Meeting Link. Students are also required to join for the online link for verification by the MSME NSQF Assessment Agency.
- Assessment Photographs are shared with the MSME NSQF Assessment Agency & are also with the respective TC.

5. Method of verification or validation:

- Online Link is send by MSME NSQF Assessment Agency to respective TC & Assessor. Reporting of the assessor from assessment location is verified by the MSME NSQF Assessment Agency through the online Meeting Link. Students are also required to join for the online link for verification by the MSME NSQF Assessment Agency.

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

- The Assessment records are shared with MSME NSQF Assessment Agency & also stored at respective TC.

- Assessor fills the assessment report and shares with the MSME NSQF Assessment Agency.

On the Job Training:

- Each module will be assessed separately.
- The candidate must score 60% marks to successfully complete the OJT.
- Learner will be assessed on the basis of OJT report followed by Viva
- Assessment will ensure that the Learner is able to:
    - ✓ Effective engagement with the customers / Subordinates and team
    - ✓ Understand the working of various tools and equipment
    - ✓ Understand the working environment of the industry

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 define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
Qualification	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
Qualification File	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
Sector	A grouping of professional activities 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