QUALIFICATION FILE

Manufacturing Team Challenge

☒ 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: 4.5

Submitted By:

Automotive Skills Development Council

E-113, First Floor, Okhla Industrial Estate

Phase- III,

New Delhi-110020

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Section 1: Basic Details

<table>
<tr><td>1.</td><td>Qualification Name</td><td colspan="2">Manufacturing Team Challenge</td></tr>
<tr><td>2.</td><td>Sector/s</td><td colspan="2">Automotive</td></tr>
<tr><td>3.</td><td>Type of Qualification: ☒ New ☐ Revised ☐ Has Electives/Options
☐OEM</td><td>NQR Code & version of existing/previous qualification: (change to previous, once approved)</td><td>Qualification Name of existing/previous version:
Manufacturing Team Challenge</td></tr>
<tr><td>4.</td><td>a. OEM Name
b. Qualification Name
(Wherever applicable)</td><td colspan="2">Manufacturing Team Challenge</td></tr>
<tr><td>5.</td><td>National Qualification Register (NQR) Code &Version
(Will be issued after NSQC approval)</td><td>QG-4.5-AU-01821-2024-V1-ASDC</td><td>6. NCrF/NSQF Level: 4.5</td></tr>
<tr><td>7.</td><td>Award (Certificate/Diploma/Advance Diploma/ Any Other (Wherever applicable specify multiple entry/exits also & provide details in annexure)</td><td colspan="2">Certificate</td></tr>
<tr><td>8.</td><td>Brief Description of the Qualification</td><td colspan="2">A Manufacturing Team Challenge is responsible for designing, manufacturing, fitting, assembling, testing and commissioning components by following the standards of the organization.</td></tr>
<tr><td>9.</td><td>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification & Relevant Experience: No formal education required.
b. Age: Below 25 Years of age.</td></tr>
<tr><td>10.</td><td>Credits Assigned to this Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td>16</td><td>11. Common Cost Norm Category (I/II/III) (wherever applicable):</td></tr>
<tr><td>12.</td><td>Any Licensing requirements for Undertaking Training on This Qualification (wherever applicable)</td><td colspan="2">NA</td></tr>
<tr><td>13.</td><td>Training Duration by Modes of Training Delivery
(Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</td><td colspan="2">☒Offline ☐Online ☐Blended
<table>
<tr><th>Training Delivery Modes</th><th>Theory (Hours)</th><th>Practical (Hours)</th><th>OJT Mandatory (Hours)</th><th>OJT Recommended (Hours)</th><th>Total (Hours)</th></tr>
<tr><td>Classroom (offline)</td><td>84:00</td><td>84:00</td><td>342:00</td><td>00:00</td><td>510:00</td></tr>
<tr><td>Online</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>
(Refer Blended Learning Annexure for details)</td></tr>
</table>

14.	**Aligned to NCO/ISCO Code/s** *(if no code is available mention the same)*		
15.	**Progression path after attaining the qualification** *(Please show Professional and Academic progression)*		
16.	**Other Indian languages in which the Qualification & Model Curriculum are being submitted**		
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**	The inclusion of women in the workplace is important as there is an increase in the number of educated women. Despite progress in some areas, women still face significant challenges and barriers to their full participation in the workforce. This can be addressed by formulating policy measures on skilling, job creation and support services. To increase the proportion of women in the workforce, various support measures like childcare facilities, proximity to the workplace, safe transportation, gender acceleration plans and return to work (allowing women to re-join the workforce after motherhood) should be provided. Organisations should provide flexible work arrangements like part-time or remote work options. This not only helps the organisation to retain talented women employees, but it also helps women to balance work and family responsibilities.	
20.	**Are Greening/ Environment Sustainability Aspects Covered** *(Specify the NOS/Module which covers it)*	**☒ Yes ☐ No** Work organization and management	
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:** Automotive Skills Development Council **Email:** ceo@asdc.org.in **Contact No.:** 011-42599800 **Website:** www.asdc.org.in	
23.	**Final Approval Date by NSQC: 06-02-2024**	**24. Validity Duration: 2 Years**	**25. Next Review Date: 06-02-2026**

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.	Work organization and management	ASC/N9826	Non-Core	4.5	1	6	6	18	0	30	50	30	0	20	100	5
2.	Communication and interpersonal skills	ASC/N9827	Non-Core	4.5	1	6	6	18	0	30	50	30	0	20	100	5
3.	Design and realization	ASC/N8362	Core	4.5	1.5	9	9	27	0	45	25	65	0	10	100	10
4.	Drawing	ASC/N8363	Core	4.5	1.5	9	9	27	0	45	25	65	0	10	100	10
5.	Component manufacture using workshop machinery and equipment	ASC/N8364	Core	4.5	4	18	18	84	0	120	60	130	0	10	200	30
6.	Fitting and assembly	ASC/N8365	Core	4.5	2.5	9	9	57	0	75	40	80	0	10	130	10
7.	Testing and commissioning	ASC/N8366	Core	4.5	4	18	18	84	0	120	30	70	0	10	110	20
8.	Additive Manufacturing	ASC/N8367	Core	4.5	1.5	9	9	27	0	45	30	70	0	10	110	10
Duration (in Hours) / Total Marks					**17**	**84**	**84**	**342**	**0**	**510**	**310**	**540**	**0**	**100**	**950**	**100**

Assessment - Minimum Qualifying Percentage
*Please specify **any one** of the following:*

Minimum Pass Percentage – Aggregate at qualification level: 70 % *(Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)*

Minimum Pass Percentage – NOS/Module-wise: 70 % *(Every Trainee should score specified minimum passing percentage in each mandatory and selected elective NOS/Module to successfully clear the assessment.)*

Section 3: Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	B.E/B.Tech (Mechanical/Automobile/ Electrical/ Electronics) with 4 years of industry and 1 year of training experience in Mechanical/ Automobile/ Electronics/ Instrumentation Or B.E/B.Tech (Mechanical/Automobile/ Electrical/ Electronics) with 5 years of industry experience in Mechanical/ Automobile/ Electronics/ Instrumentation Or Diploma (Mechanical/Automobile/ Electrical/ Electronics) with 3 years of industry and 1 year of training experience in Mechanical/ Automobile/ Electronics/ Instrumentation Or Diploma (Mechanical/Automobile/ Electrical/ Electronics) with 4 years of industry experience in Mechanical/ Automobile/ Electronics/ Instrumentation Or M.E/M.Tech (Mechanical/Automobile/ Electrical/ Electronics) with 2 years of industry and 1 year of training experience in Mechanical/ Automobile/ Electronics/ Instrumentation Or M.E/M.Tech (Mechanical/Automobile/ Electrical/ Electronics) with 3 years of industry experience in Mechanical/ Automobile/ Electronics/ Instrumentation
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	M.E/M.Tech (Mechanical/Automobile/ Electrical/ Electronics) with 4 years of industry and 1 year of training experience in Mechanical/ Automobile/ Electronics/ Instrumentation
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

	Assessor's Qualification and experience in relevant sector (in years) *(as per NCVET guidelines)*	Any Recognized certification with proven industrial and/or practical experience in the relevant skill (minimum 10 years). OR Have worked as a Jury member/expert in skill competitions and other competitions of similar nature at regional/national levels

		OR Trained/mentored competitors for IndiaSkills/ WorldSkills competitions (national/ international). **OR** As any change per NCVET guidelines.
	Proctor's Qualification and experience in relevant sector (in years) *(as per NCVET guidelines)*	As per IndiaSkills/ WorldSkills guidelines.
	Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years) *(as per NCVET guidelines)*	As per IndiaSkills/ WorldSkills guidelines.
	Assessment Mode *(Specify the assessment mode)*	Blended
	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):**
2.	**Latest Market Research Reports or any other source (not older than 2 years) (Yes/No):**
3.	**Government /Industry initiatives/ requirement (Yes/No):**
4.	**Number of Industry validation provided:**
5.	**Estimated nos. of persons to be trained and employed:**
6.	**Evidence of Concurrence/Consultation with Line Ministry/State Departments:** 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")*	*Attached*
6.	**Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification has multiple Entry-Exit)*	*Attached*
7.	**Annexure:** Acronym and Glossary *(Optional)*	*Attached*
8.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	
9.	**Supporting Document:** Career Progression *(Mandatory - Public view)*	
10.	**Supporting Document:** Occupational Map *(Mandatory)*	
11.	**Supporting Document:** Assessment SOP *(Mandatory)*	*Attached*
12.	**Any other document you wish to submit:**	*-*

Annexure: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/NSQF Level
Professional Theoretical Knowledge/Process	**Specialized knowledge** ● Manufacturing ● The purposes, use, care, and maintenance of all equipment and materials, together with their safety implications ● Environmental and safety principles and their application to good housekeeping in the work environment ● Principles of team working and their applications ● Personal skills, strengths and needs relative to the roles, responsibilities, and duties of others individually and collectively ● The parameters within which activities need to be scheduled ● The range and purposes of documentation in both paper-based and electronic forms ● The technical language associated with the skill and technology ● The standards required for routine and exception reporting in oral, written, and electronic form ● The required standards for communicating with clients, team members and others ● The purposes and techniques for maintaining and presenting records, including financial records ● The principles and applications of project design ● The nature and formats of project specifications ● The basis on which the manufactured item will be appraised ● Design parameters including - Options appraisal, Selection of materials and work processes, Prototype development, Manufacture, Refinement, and Commissioning ● Principles and methods for work organization, control, and management	● A Manufacturing Team Challenge should have a proper knowledge of manufacturing, maintenance of equipment, principles and applications of project design, design parameters, component manufacturing using workshop machinery, principles and methods for manufacturing, assembling and fastening parts, operate test runs, creative and innovative thinking skills, principles and methods to design parts using software, designing for variety of materials, principles and methods to manufacture quality goods in reduced production time, occupational health and safety requirements, good housekeeping principles, team work, good communication skills and information gathering skills from documentation and client. ● Hence Level 4	4.5

	● How to interpret drawings that conform to ISO standards ● How to create drawings that conform to ISO standards ● The principles and uses of 2D and 3D modelling software ● The specific safety principles and practices to be used with a range of workshop machinery/equipment and materials ● The principles and applications of machining ● The use of general machining equipment used in activities such as centre lathing and manual milling ● The relationship between drawings and machining, including modifying the machining to meet specifications ● The characteristics of metals and the potential impact on them of cutting tools and processes ● The applications of machining to a range of metals and materials ● The principles and applications of working with sheet metal ● The processes required for bending and cutting sheet metal ● The principles and applications of a range of welding types, including TIG (for steel and aluminium) and MAG (for steel) ● The principles and applications for working with electronics and related equipment ● The principles and uses of PCBs ● The principles and applications of electronic programming software ● The principles and applications of robotics and mechatronics ● The principles of manual pipe bending ● Principles and methods for manufacturing parts such as jigs, fixtures, adaptors and process attachments		

	● Principles and methods for assembly and fastening of manufactured parts such as jigs, fixtures, adaptors, and process attachments ● The criteria and methods for operating test runs ● The scope and limits of the technologies and methods employed ● Strategies for thinking creatively and generating innovation ● The possibilities and options for making incremental and/or radical changes ● Principles and methods to design parts ● Principles and methods to design parts in special software ● Principles and methods to make postprocessing for 3D printers (FDM, SLS, DLP and SLM) ● Principles and methods to design parts considering a variety of materials used ● Principles and methods to reduce production time keeping with quality in resistance and durability ● Principles of part design for manufacture ● Principles of machine settings and refinement for differing materials		
Professional and Technical Skills/ Expertise/ Professional Knowledge	**Specialized skills** ● Schedule work to maximize efficiency and minimize disruption ● Select and use all equipment and materials safely and in compliance with manufacturers' instructions ● Apply or exceed the health and safety standards applied to the environment, equipment, and materials ● Restore the work area to an appropriate state and condition ● Contribute to team performance both broadly and specifically ● Give and take feedback and support	● A Manufacturing Team Challenge needs to have basic communication skills in verbal, written and electronic means, and follow established health and safety standards, comply with the manufacturer's instructions, read, interpret and extract technical data, respond to clients, reduce waste and maximise material utilization. ● Hence Level 4	4.5

	● Manufacture components and assembly to meet cost constraints and record manufacturing costs and budgets ● Maximize material utilization to reduce waste ● Read, interpret, and extract technical data and instructions from documentation in any available format ● Communicate by oral, written and electronic means to ensure clarity, effectiveness, and efficiency ● Use a standard range of communication technologies ● Explain complex technical principles and applications to non-experts ● Complete reports and respond to issues and questions arising ● Respond to clients' needs face-to-face and indirectly ● Arrange to gather information and prepare documentation as required by the client		
Employment Readiness & Entrepreneurship **Skills & Mind-set/Professional Skill**	**Team readiness, self-entrepreneurship readiness** ● Read and write different types of documents/instructions/correspondence ● Communicate effectively using appropriate language in formal and informal settings ● Behave politely and appropriately with all ● How to work in a virtual mode ● Perform calculations efficiently ● Solve problems effectively ● Pay attention to details ● Manage time efficiently ● Maintain hygiene and sanitization to avoid infection	● A Manufacturing Team Challenge should have good oral and written communication skills, advanced literacy and numeracy skills, organisation and time management skills, good understanding of social, political and work environments, etc.	4.5
Broad Learning Outcomes/Core Skill	**Specialized/ complex jobs/tasks** ● Work organization and management ● Communication and interpersonal skills ● Design and realization	● A Manufacturing Team Challenge is responsible for designing, drawing, manufacturing, fitting,	4.5

	• Drawing • Component manufacture using workshop machinery and equipment • Fitting and assembly • Testing and commissioning • Additive Manufacturing	assembling, testing and commissioning components, designing using software and using 3D printers as per the organizational standards. This person works in a familiar, predictable, routine, situation at the workplace. • Hence Level 4	
Responsibility	**Self and team responsibility – Sr. Technician or Master Technician** • Designing components • Create drawings • Manufacturing components • Fitting and assembling manufactured components • Testing and commissioning components • Design parts using software • Work on 3D Printers • Communicate effectively with clients and others • Follow occupational health and safety procedures • Maximise material utilization and reduce waste	• A Manufacturing Team Challenge is responsible for designing, manufacturing, fitting, assembling, testing and commissioning of components by following the standards of the organization. This person is responsible for their own work. • Hence Level 4	4.5

Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment
Batch Size: 30

S. No.	Tool / Equipment Name	Specification	Quantity for specified Batch size
1.	Specifications for manufactured items	Standard	01
2.	Rulers	Standard	01
3.	Verniers	Standard	01
4.	Micrometer	Standard	01
5.	Digital measuring tools	Standard	01

6.	Formats of project specifications	Standard	01
7.	Drawings	Standard	01
8.	2D and 3D modelling software	Standard	01
9.	Lathes	Standard	01
10.	Mills	Standard	01
11.	Drill presses	Standard	01
12.	Sheet metal working equipment	Standard	01
13.	Welding equipment	Standard	01
14.	Welding holding equipment	Standard	01
15.	Pipe bending equipment	Standard	01
16.	Electronics bench equipment (soldering iron, PSU)	Standard	01
17.	Fasteners like glues, screws, bolts	Standard	01
18.	3D printers	Standard	01
19.	Variety of materials for component manufacturing	Standard	01
20.	Sample operating and maintenance manuals	Standard	01
21.	Personal Protection Equipment: Safety glasses, Head protection, Rubber gloves, Safety footwear, Warning signs and tapes, Fire extinguisher, First aid kit	Standard	01
22.	Relevant Standard Operating Procedures	Standard	01
23.	Sample reports	Standard	01
24.	Any Other as per requirement of World Skills Occupation Standard	Standard	Standard

Classroom Aids
The aids required to conduct sessions in the classroom are:

1. Whiteboard

2. Flip Chart
3. Duster
4. Projector
5. Projector screen
6. Computer/ Laptop with charger
7. PowerPoint Presentation
8. 2.1 Laptop External Speakers
9. Training kit (Trainer guide, Presentations)
10. Participant Handbook and Related Standard Operating Procedures
11. Markers
12. Chalk

Annexure: Industry Validations Summary

Provide the summary information of all the industry validations in the 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.							
2.							

Annexure: 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
2023-24	100	150	50	50	50	35
2024-25	150	200	75	75	100	75
2025-26	200	250	100	100	100	75

Data to be provided year-wise for next 3 years

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

Qualification Version	Year	Total Candidates				Women				People with Disability			
		Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed	Trained	Assessed	Certified	Placed

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

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

1. World Skills
2. India Skills

Content availability for previous versions of qualifications:

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

Languages in which Content is available:

Annexure: Blended Learning

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	100:0
2	□Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners	• Self-Learning Videos • Broadcasts • Mobile Learning • Curated Digital content	100:0
3	□Showing Practical Demonstrations to the learners	• Video Content • E-Resource library • AR/ VR/ XR	100:0
4	□Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training	• Training tools (tools list attached) • Video Play • Presentations	100:0
5	□Tutorials/ Assignments/ Drill/ Practice	• Online Question Bank • Mobile Quick test app • MCQ based tests	100:0
6	□Proctored Monitoring/ Assessment/ Evaluation/ Examinations	• Assessment engine for Essays • Up-loadable file examinations • Mock test sessions	100:0
7	□On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training	• Online tests • Offline assessments	100:0

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
Work organization and management					
	PC1. prepare and maintain a safe, tidy, and efficient work area	-	-	-	-
	PC2. prepare self for the tasks in hand, including full regard to health and safety	-	-	-	-
	PC3. schedule work to maximize efficiency and minimize disruption	-	-	-	-
	PC4. select and use all equipment and materials safely and in compliance with manufacturers' instructions	-	-	-	-
	PC5. apply or exceed the health and safety standards applying to the environment, equipment, and materials	-	-	-	-
	PC6. restore the work area to an appropriate state and condition	-	-	-	-
	PC7. contribute to team performance both broadly and specifically	-	-	-	-
	PC8. give and take feedback and support	-	-	-	-
	PC9. manufacture components and assembly to meet cost constraints and record manufacturing costs and budgets	-	-	-	-
	PC10. maximize material utilization in order to reduce waste	-	-	-	-
	Total Marks	**50**	**30**	**0**	**20**
Communication and interpersonal skills					
	PC1. read, interpret, and extract technical data and instructions from documentation in any available format	-	-	-	-
	PC2. communicate by oral, written and electronic means to ensure clarity, effectiveness, and efficiency	-	-	-	-
	PC3. use a standard range of communication technologies	-	-	-	-
	PC4. explain complex technical principles and applications to non-experts	-	-	-	-
	PC5. complete reports and respond to issues and questions arising	-	-	-	-
	PC6. respond to clients' needs face to face and indirectly	-	-	-	-

	PC7. arrange to gather information and prepare documentation as required by the client	-	-	-	-
	Total Marks	**50**	**30**	**0**	**20**
Design and realization					
	PC1. read and interrogate briefs or specifications for manufactured items	-	-	-	-
	PC2. identify and resolve areas of uncertainty within the briefs or specifications	-	-	-	-
	PC3. generate designs for the manufacture of a functioning item within given timescales	-	-	-	-
	PC4. generate innovative solutions to design challenges	-	-	-	-
	PC5. prepare and implement documentation for work management and control	-	-	-	-
	PC6. complete the design stage within the required limits of cost and time	-	-	-	-
	PC7. use of engineering measurement tools including rules, verniers, micrometres and digital measuring tools	-	-	-	-
	Total Marks	**25**	**65**	**0**	**10**
Drawing					
	PC1. create drawings to ISO standards	-	-	-	-
	PC2. create and modify 2D and 3D models	-	-	-	-
	PC3. interpret, construct, and modify engineering CAD drawings to work with 3D modelling and to convert both to CAM	-	-	-	-
	PC4. complete drawing activities within the planned timetable and to suit the project's overall requirements	-	-	-	-
	Total Marks	**25**	**65**	**0**	**10**
Component manufacture using workshop machinery and equipment					
	PC1. safely operate workshop equipment such as lathes, mills, drill presses, sheet metal working equipment, welding equipment and welding holding equipment, pipe bending equipment and electronics bench equipment, such as a soldering iron and PSU	-	-		-
	PC2. apply safe working practices to all workshop equipment and processes.	-	-		-

	PC3. address the issues caused by temperature during machining, including the use of coolants	-	-		-
	PC4. manufacture components to industry finishes and tolerances and adjust manufacturing process to meet specifications	-	-		-
	PC5. bend and cut sheet metal components in accordance with drawings	-	-		-
	PC6. fit sheet metal components to an assembly	-	-		-
	PC7. weld a variety of materials	-	-		-
	PC8. use a range of welding types	-	-		-
	PC9. assemble and commission electronics from drawings	-	-		-
	PC10. design control circuits	-	-		-
	Total Marks	**60**	**130**		**10**
Fitting and assembly					
	PC1. Design a range of jigs, fixtures, and accessories	-	-		-
	PC2. Manufacture jigs, fixtures, and accessories in accordance with drawings and specifications	-	-		-
	PC3. Assemble and commission items in accordance with drawings and specifications	-	-		-
	PC4. Assemble items using fasteners such as glues, screws, bolts, etc.	-	-		-
	PC5. Complete the fitting activity within the planned timetable and to suit the project's overall requirements	-	-		-
	Total Marks	**40**	**80**		**10**
Testing and commissioning					
	PC1. test run the assembled item	-	-		-
	PC2. review each part of the manufacturing and assembly process against established criteria, including quality, functionality, time, and cost	-	-		-
	PC3. modify, test, and appraise each part of the process, including:, design, tool paths, assembly procedures, jigs, fixtures, machining	-	-		-
	PC4. undertake a final test run to commission the item	-	-		-

	PC5. present the item to the client with explanations and responses to questions	-	-		-
	PC6. generate and present a portfolio including all essential documentation such as: 2D mechanical drawings, electronic solid models, electrical drawings, manufacturing plans, design calculations ,manufacturing costs	-	-		-
	PC7. generate support documents such as:the operating manual, the maintenance manual	-	-		-
	Total Marks	**30**	**70**		**10**
Additive Manufacturing					
	PC1. design parts in the special software (www.autodesk.com/solutions/generative-design)	-	-		-
	PC2. calculate the variety of materials used	-	-		-
	PC3. postprocess jobs of 3D printers	-	-		-
	PC4. start and control the process	-	-		-
	PC5. operate a 3D printer	-	-		-
	PC6. adjust and set up parameters for 3D printing; interpret drawings	-	-		-
	PC7. respond to engineering problems with a rapid prototype design	-	-		-
	PC8. design solutions given a variety of parameters; size, weight, durability, function and finish	-	-		-
	PC9. design assemblies for parts larger than the print area of the given machine, or for interconnecting, moving, interlocking or interacting pieces	-	-		-
	Total Marks	**30**	**70**		**10**
Grand Total		**310**	**540**	**0**	**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 assigned to the assessment agencies for conducting the assessment on 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:

- Check the Assessment location, date and time
- If the batch size is more than 30, then there should be 2 Assessors.
- Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.

3. Assessment Quality Assurance levels/Framework:

- Question bank is created by the Subject Matter Experts (SME) are verified by the other SME
- Questions are mapped to the specified assessment criteria
- Assessor must be ToA certified & trainer must be ToT Certified

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

5. Method of verification or validation:

- Surprise visit to the assessment location

6. Method for assessment documentation, archiving, and access

- Hard copies of the documents are stored

On the Job:

1. Each module (which covers the job profile of Manufacturing Team Challenge will be assessed separately.
2. The candidate must score 70% 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
   •
4. Assessment of each Module will ensure that the candidate is able to:

- Effective engagement with the customers
- Understand the working of various tools and equipment
- …..>

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
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
PPE	Personal Protective Equipment
HACCP	Hazard Analysis and Critical Control Points
ISO	International Standards Organization
OH&S	Occupational Health and Safety

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