

Instruction Sheet for the Candidate

Qualification	National Vocational Certificate in Metal Forming & Processing Level 5
Competency Standard	Perform Computerized Numerical Control, CNC Operations
Purpose of Assessment	Formative Assessment
Candidate Details	Name_____ Registration/Roll Number_____
Guidance for Candidate	<p>To meet this standard, you are required to complete the following within 04 Hrs. time frame (for practical demonstration & assessment):</p> <ul style="list-style-type: none"> • CU1. Set-up CNC machine • CU2. Run Simulation • CU3. Feed the Program • CU4. Carry out CNC Lathe/Milling Operations • CU5. Perform CNC water jet cutting Operations • CU6. Perform CNC laser cutting Operations
Time: 04 Hrs.	During a practical assessment, under observation by an assessor, you are required to
Minimum Evidence Required	<p>CU1. Set-up CNC machine</p> <p>P1. Select required work holding device(s) in order to achieve dimensional accuracy</p> <p>P2. Mount the work-piece by considering the working capacity of machine as well as job requirement according to the drawing/design.</p> <p>P3. Attain proper alignment of tool/cutter and work-piece e.g. concentricity of rotating jobs as per set practice</p> <p>P4. Set up and adjust machine according to parameters to achieve work specification.</p> <p>P5. Report uncertainties and deviations to person concerned for timely action.</p> <p>P6. Maintain safe measures while mounting the work-piece so that unwanted operation by machine may not be initiated as per safety precautions</p> <p>CU2. Run Simulation</p> <p>P1. Feed the generated part program into required simulation</p>

	<p>platform and run simulation for checking the tool gouge according to safety measures</p> <p>P2. Run simulation and verify movements of tool/cutter to get same results as per defined sequence</p> <p>P3. Identify occurrence of errors and modify the program as per defined procedure</p> <p>CU3. Feed the Program</p> <p>P1. Maintain synchronization between machine control unit and part program file as per standard operating procedure</p> <p>P2. Switch machine to receiving mode and feed the desired part program file into machine control unit for further execution as per standard operating procedure</p> <p>P3. Select the desired part program file for execution as per standard operating procedure</p> <p>CU4. Carry out CNC Lathe/Milling Operations</p> <p>P1. Perform dry run-on CNC Lathe/Milling machines to ensure safety measures.</p> <p>P2. Control the feeds, speeds and override of machine before operating according to the prescribed procedure</p> <p>P3. Switch machine to execution mode (single block or auto) and press cycle start to run the machining sequence as per prescribed method</p> <p>P4. Compare the block-wise movements of machining sequence thoroughly during operation of machine according to the part program file</p> <p>P5. Complete the job and inspect its accuracy and precision according to the drawing/design</p> <p>CU5. Perform CNC water jet cutting Operations</p> <p>P1. Perform dry run on CNC water jet cutting machine to ensure safety measures.</p> <p>P2. Arrange abrasive material with water jet spray as per requirement</p> <p>P3. Adjust the feeds, speeds and pressure by adjusting amperes and current setting before operating according to the prescribed procedure</p> <p>P4. Switch machine to execution mode and start to work on defined tool-path as per prescribed method</p> <p>P5. Compare the movements of machining sequence thoroughly</p>
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	<p>during operating of machine according to the part program file</p> <p>P6. Complete the job and inspect its accuracy and precision according to the drawing/design</p> <p>CU6. Perform CNC laser cutting Operations</p> <p>P1. Perform dry run-on CNC laser cutting machine to ensure safety measures.</p> <p>P2. Connect CO2 gas cylinder and accessories with machine as per requirement</p> <p>P3. Adjust the feeds, speeds by adjusting amperes and current setting before operating according to the prescribed procedure</p> <p>P4. Switch machine to execution mode and start to work on defined tool path as per prescribed method</p> <p>P5. Compare the movements of machining sequence thoroughly during operating of machine according to the part program file</p> <p>P6. Complete the job and inspect its accuracy and precision according to the drawing/design</p>
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Self-Assessment Checklist

Candidate Name	
Registration No.	
Qualification	National Vocational Certificate in Metal Forming & Processing Level 5
Competency Standard	Perform Computerized Numerical Control, CNC Operations
Purpose of Assessment	Formative Assessment
Assessment Task	<ul style="list-style-type: none"> • CU1. Set-up CNC machine • CU2. Run Simulation • CU3. Feed the Program • CU4. Carry out CNC Lathe/Milling Operations • CU5. Perform CNC water jet cutting Operations • CU6. Perform CNC laser cutting Operations

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Performance Criteria	Yes	No
P1. Select required work holding device(s) in order to achieve dimensional accuracy	<input type="checkbox"/>	<input type="checkbox"/>
P2. Mount the work-piece by considering the working capacity of machine as well as job requirement according to the drawing/design.	<input type="checkbox"/>	<input type="checkbox"/>
P3. Attain proper alignment of tool/cutter and work-piece e.g. concentricity of rotating jobs as per set practice	<input type="checkbox"/>	<input type="checkbox"/>
P4. Set up and adjust machine according to parameters to achieve work specification.	<input type="checkbox"/>	<input type="checkbox"/>
P5. Report uncertainties and deviations to person concerned for timely action.	<input type="checkbox"/>	<input type="checkbox"/>
P6. Maintain safe measures while mounting the work-piece so that unwanted operation by machine may not be initiated as per safety precautions	<input type="checkbox"/>	<input type="checkbox"/>
P7. Feed the generated part program into required simulation platform and run simulation for checking the tool gouge according to safety measures	<input type="checkbox"/>	<input type="checkbox"/>
P8. Run simulation and verify movements of tool/cutter to get same results as per defined sequence	<input type="checkbox"/>	<input type="checkbox"/>
P9. Identify occurrence of errors and modify the program as per defined procedure	<input type="checkbox"/>	<input type="checkbox"/>
P10. Maintain synchronization between machine control unit and part program file as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
P11. Switch machine to receiving mode and feed the desired part program file into machine control unit for further execution as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>

P12.	Select the desired part program file for execution as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
P13.	Perform dry run-on CNC Lathe/Milling machines to ensure safety measures.	<input type="checkbox"/>	<input type="checkbox"/>
P14.	Control the feeds, speeds and override of machine before operating according to the prescribed procedure	<input type="checkbox"/>	<input type="checkbox"/>
P15.	Switch machine to execution mode (single block or auto) and press cycle start to run the machining sequence as per prescribed method	<input type="checkbox"/>	<input type="checkbox"/>
P16.	Compare the block-wise movements of machining sequence thoroughly during operation of machine according to the part program file	<input type="checkbox"/>	<input type="checkbox"/>
P17.	Complete the job and inspect its accuracy and precision according to the drawing/design	<input type="checkbox"/>	<input type="checkbox"/>
P18.	Perform dry run-on CNC water jet cutting machine to ensure safety measures.	<input type="checkbox"/>	<input type="checkbox"/>
P19.	Arrange abrasive material with water jet spray as per requirement	<input type="checkbox"/>	<input type="checkbox"/>
P20.	Adjust the feeds, speeds and pressure by adjusting amperes and current setting before operating according to the prescribed procedure	<input type="checkbox"/>	<input type="checkbox"/>
P21.	Switch machine to execution mode and start to work on defined tool-path as per prescribed method	<input type="checkbox"/>	<input type="checkbox"/>
P22.	Compare the movements of machining sequence thoroughly during operating of machine according to the part program file	<input type="checkbox"/>	<input type="checkbox"/>
P23.	Complete the job and inspect its accuracy and precision according to the drawing/design	<input type="checkbox"/>	<input type="checkbox"/>
P24.	Perform dry run on CNC laser cutting machine to ensure safety measures.	<input type="checkbox"/>	<input type="checkbox"/>
P25.	Connect CO2 gas cylinder and accessories with machine as per requirement	<input type="checkbox"/>	<input type="checkbox"/>
P26.	Adjust the feeds, speeds by adjusting amperes and current setting before operating according to the prescribed procedure	<input type="checkbox"/>	<input type="checkbox"/>
P27.	Switch machine to execution mode and start to work on defined tool path as per prescribed method	<input type="checkbox"/>	<input type="checkbox"/>
P28.	Compare the movements of machining sequence thoroughly during operating of machine according to the part program file	<input type="checkbox"/>	<input type="checkbox"/>
P29.	Complete the job and inspect its accuracy and precision according to the drawing/design	<input type="checkbox"/>	<input type="checkbox"/>

Candidate's Signature _____ Assessor's Signature _____

Date: _____

Assessors Judgment Guide

Qualification	National Vocational Certificate in Metal Forming & Processing Level 5
Competency Standard	Perform Computerized Numerical Control, CNC Operations
Purpose of Assessment	Formative Assessment
Candidate Details	Name: _____ Registration/Roll Number: _____ Signature: _____
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor _____ Assessor's code: _____ Signature: _____

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment		✓					
Other Requirement							

Observation Checklist

Assessment Task		<ul style="list-style-type: none">• CU1. Set-up CNC machine• CU2. Run Simulation• CU3. Feed the Program• CU4. Carry out CNC Lathe/Milling Operations• CU5. Perform CNC water jet cutting Operations• CU6. Perform CNC laser cutting Operations		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Select required work holding device(s) in order to achieve dimensional accuracy			
2.	Mount the work-piece by considering the working capacity of machine as well as job requirement according to the drawing/design.			
3.	Attain proper alignment of tool/cutter and work-piece e.g. concentricity of rotating jobs as per set practice			
4.	Set up and adjust machine according to parameters to achieve work specification.			
5.	Report uncertainties and deviations to person concerned for timely action.			
6.	Maintain safe measures while mounting the work-piece so that unwanted operation by machine may not be initiated as per safety precautions			
7.	Feed the generated part program into required simulation platform and run simulation for checking the tool gouge according to safety measures			
8.	Run simulation and verify movements of tool/cutter to get same results as per defined sequence			
9.	Identify occurrence of errors and modify the program as per defined procedure			
10.	Maintain synchronization between machine control unit and part program file as per standard operating procedure			
11.	Switch machine to receiving mode and feed the desired part program file into machine control unit for further execution as per standard operating procedure			
12.	Select the desired part program file for execution as per standard operating procedure			
13.	Perform dry run on CNC Lathe/Milling machines to ensure safety measures.			

14.	Control the feeds, speeds and override of machine before operating according to the prescribed procedure			
15.	Switch machine to execution mode (single block or auto) and press cycle start to run the machining sequence as per prescribed method			
16.	Compare the block-wise movements of machining sequence thoroughly during operation of machine according to the part program file			
17.	Complete the job and inspect its accuracy and precision according to the drawing/design			
18.	Perform dry run on CNC water jet cutting machine to ensure safety measures.			
19.	Arrange abrasive material with water jet spray as per requirement			
20.	Adjust the feeds, speeds and pressure by adjusting amperes and current setting before operating according to the prescribed procedure			
21.	Switch machine to execution mode and start to work on defined tool-path as per prescribed method			
22.	Compare the movements of machining sequence thoroughly during operating of machine according to the part program file			
23.	Complete the job and inspect its accuracy and precision according to the drawing/design			
24.	Perform dry run on CNC laser cutting machine to ensure safety measures.			
25.	Connect CO2 gas cylinder and accessories with machine as per requirement			
26.	Adjust the feeds, speeds by adjusting amperes and current setting before operating according to the prescribed procedure			
27.	Switch machine to execution mode and start to work on defined tool path as per prescribed method			
28.	Compare the movements of machining sequence thoroughly during operating of machine according to the part program file			
29.	Complete the job and inspect its accuracy and precision according to the drawing/design			

Competent <input type="checkbox"/>	Not Yet Competent <input type="checkbox"/>
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Knowledge Assessment

Qualification	National Vocational Certificate in Metal Forming & Processing Level 5
Competency Standard	Perform Computerized Numerical Control, CNC Operations
Purpose of Assessment	Formative Assessment
Candidate Details	Name: _____ Registration/Roll Number: _____ Candidate Signature: _____
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: _____ Assessor's code: _____ Signature of the Assessor: _____

Candidate's response is not required to be identical, but similar concepts and/or keywords must be used. Oral questioning may be used to clarify candidate understanding of topic and its application.

Questions (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)		Satisfactory	Not Satisfactory
1.	What is G-Code and M-Code.		
2.	State coordinate system X, Y, and Z axis		

3.	What are the main Functions of CNC Lathe Machine		
4.	Describe Boring and counter boring		
5.	State Grooving, taper turning, step turning		
6.	What are Safety precautions of CNC machines		

Feedback to the Candidate
Candidate's Signature _____ Assessor's Signature _____