

# **Assessment Evidence Guide**

## **for**

### **“CAD/CAM Supervisor”**

**Level-5**  
(Summative Assessment)



**National Vocational & Technical  
Training Commission**

## Instruction Sheet for the Candidate

<b>Title of Qualification:</b> National Certificate of level 5 in Computer Aided Design & Manufacturing (CAD/CAM Supervisor)	<b>CS Code:</b> 	<b>Level: 5</b> 	<b>Version:01</b> 
<b>Competency Standard Title:</b> Develop Basic CNC Code for Milling Machine Develop Advance 3D Modelling using CREO Parametric /Solid Develop Part Assembly using CREO Parametric Perform CAM Operation using Power Mill Apply Animation and Render3D Model using Lumion Develop 3D Model Using Autodesk 3ds Max Design a Basic Project using BIM Technology Implement a design for basic project using BIM Technology Plan a Project in Primavera P6 Develop a Basic Interior House Plan Using Blocks Develop Entrepreneurial Skills Coordinate a Work Team Implement Green skills	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time: 4 hrs.</b>		

Candidate Details	Name: .....  Registration/Roll Number:.....
Guidance for Candidate	<p><b>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration &amp; assessment):</b></p> <p><b>Assessment Task 1:</b> Candidate is required to develop advance 3-D model of part assembly using CREO parametric as per instructions provided in Annexure-I as per instructions given by assessor.</p> <p><b>Assessment Task 2:</b> Candidate is required to manage construction project in Primavera P6 as per instructions provided in Annexure-II</p> <p><b>And complete:</b></p> <ol style="list-style-type: none"> <li><b>Knowledge assessment test (Written or Oral)</b></li> <li><b>Portfolios at the time of assessment (if any)</b></li> </ol>
Minimum Evidence Required	<p><b>During a practical assessment, under observation by an assessor, you will complete:</b></p> <p><b>Assessment Task 1</b></p> <p><b>Performance Criteria 1:</b> Create sweep and helical sweep</p> <p><b>Performance Criteria 2:</b> Create 3d using Blend</p> <p><b>Performance Criteria 3:</b> Create 3d using swept blend</p> <p><b>Performance Criteria 4:</b> Draw drawing layout</p> <p><b>Performance Criteria 5:</b> Import model to drawing mode</p>

	<p><b>Performance Criteria 6:</b> Manage paper template as per given requirements.</p> <p><b>Performance Criteria 7:</b> Manage/configure the properties of view</p> <p><b>Performance Criteria 8:</b> Extract view from existing view</p> <p><b>Performance Criteria 9:</b> Create default view</p> <p><b>Performance Criteria 10:</b> Create section view</p> <p><b>Performance Criteria 11:</b> Create detail view</p> <p><b>Performance Criteria 12:</b> Annotate the view and apply dimensions</p> <p><b>Performance Criteria 13:</b> Edit annotations</p>
	<p><b>Assessment Task 2</b></p> <p><b>Performance Criteria 1:</b> Add Project in Primavera</p> <p><b>Performance Criteria 2:</b> Create WBS of project in Primavera.</p> <p><b>Performance Criteria 3:</b> Create Activities of project in Primavera.</p> <p><b>Performance Criteria 4:</b> Create Relationships between activities of project in Primavera.</p> <p><b>Performance Criteria 5:</b> Create Schedule of activities of project in Primavera.</p> <p><b>Performance Criteria 6:</b> Add constraints of activities of project in Primavera.</p> <p><b>Performance Criteria 7:</b> Create Calendar for activities of project in Primavera.</p>
	<p><b>Portfolios required at the time of assessment (if any) for</b></p> <ul style="list-style-type: none"> <li>✓ File/folder includes evidence about Basic CNC Code for Milling Machine</li> <li>✓ File/folder includes evidence about CAM Operation using Power Mill</li> <li>✓ File/folder includes evidence about Animation and Render3D Model using Lumion</li> <li>✓ File/folder includes evidence about Develop 3D Model Using Autodesk 3ds Max</li> <li>✓ File/folder includes evidence about Design a Basic Project using BIM Technology</li> <li>✓ File/folder includes evidence about Implement a Design for Basic Project Using BIM Technology</li> <li>✓ File/folder includes evidence about Basic Interior House Plan Using Blocks</li> </ul> <p><b>Performance Criteria 1:</b> Develop standard Program for CNC Milling operations, in accordance with coding standard.</p> <p><b>Performance Criteria 2:</b> Perform Basic CNC milling operations to produce component as programmed.</p> <p><b>Performance Criteria 3:</b> Apply surface finishing strategy</p> <p><b>Performance Criteria 4:</b> Edit CNC code as per requirements</p> <p><b>Performance Criteria 5:</b> Simulate the CNC code.</p> <p><b>Performance Criteria 6:</b> Add timeline to the movement of the object.</p> <p><b>Performance Criteria 7:</b> Apply movement of shadows according to the movement of light.</p> <p><b>Performance Criteria 8:</b> Apply setting of camera according to the movement of light and object.</p>

	<p><b>Performance Criteria 9:</b> Modify Parameters of 3D objects according to given specification.</p> <p><b>Performance Criteria 10:</b> Create/assign specified materials and textures to 3D Model.</p> <p><b>Performance Criteria 11:</b> Add lights for illumination to get the requisite scene of 3D model.</p> <p><b>Performance Criteria 12:</b> Assign cameras to execute different views of 3D Model.</p> <p><b>Performance Criteria 13:</b> Render the 3D model according to required image size or resolution &amp; orientation.</p> <p><b>Performance Criteria 14:</b> Develop innovative and affordable sustainable design solutions in the workplace environment.</p> <p><b>Performance Criteria 15:</b> Use computer software to produce building designs, manage project participation and conduct general personal business administration</p> <p><b>Performance Criteria 16:</b> Download and import blocks for furniture layout</p> <p><b>Performance Criteria 17:</b> Adjust size and scale according to plan</p>
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*Continued on following page*

## Assessors Judgment Guide

(to be completed by the Assessor and signed both by the assessor and the candidate after the 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:.....

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			
<b>Assessment Task 1</b>		<b>Description of Assessment Task 1</b> develop advance 3-D model of part assembly using CREO parametric as per instructions provided in Annexure-I as per instructions given by assessor.	
During the practical assessment, candidate demonstrated the following:		Yes	No
1.	Create sweep and helical sweep		
2.	Create 3d using Blend		
3.	Create 3d using swept blend		
4.	Draw drawing layout		
5.	Import model to drawing mode		
6.	Manage paper template as per given requirements.		
7.	Manage/configure the properties of view		
8.	Extract view from existing view		
9.	Create default view		
10.	Create section view		
11.	Create detail view		
12.	Annotate the view and apply dimensions		
13.	Edit annotations		

Observation Checklist				
<b>Assessment Task 2</b>		<b>Description of Assessment Task 2</b> manage construction project in Primavera P6 as per instructions provided in Annexure-II		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Add Project in Primavera			
2.	Create WBS of project in Primavera.			
3.	Create Activities of project in Primavera.			
4.	Create Relationships between activities of project in Primavera.			
5.	Create Schedule of activities of project in Primavera.			
6.	Add constraints of activities of project in Primavera.			
7.	Create Calendar for activities of project in Primavera.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Portfolio		Description of Portfolio		
		<div><div>✓</div>File/folder includes evidence about Basic CNC Code for Milling Machine</div> <div><div>✓</div>File/folder includes evidence about CAM Operation using Power Mill</div> <div><div>✓</div>File/folder includes evidence about Animation and Render3D Model using Lumion</div> <div><div>✓</div>File/folder includes evidence about Develop 3D Model Using Autodesk 3ds Max</div> <div><div>✓</div>File/folder includes evidence about Design a Basic Project using BIM Technology</div> <div><div>✓</div>File/folder includes evidence about Implement a Design for Basic Project Using BIM Technology</div> <div><div>✓</div>File/folder includes evidence about Basic Interior House Plan Using Blocks</div>		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Develop standard Program for CNC Milling operations, in accordance with coding standard.			
2.	Perform Basic CNC milling operations to produce component as programmed.			
3.	Apply surface finishing strategy			
4.	Edit CNC code as per requirements			
5.	Simulate the CNC code.			
6.	Add timeline to the movement of the object.			
7.	Apply movement of shadows according to the movement of light.			
8.	Apply setting of camera according to the movement of light and object.			
9.	Modify Parameters of 3D objects according to given specification.			
10.	Create/assign specified materials and textures to 3D Model.			
11.	Add lights for illumination to get the requisite scene of 3D model.			
12.	Assign cameras to execute different views of 3D Model.			
13.	Render the 3D model according to required image size or resolution & orientation.			
14.	Develop innovative and affordable sustainable design solutions in the workplace environment.			
15.	Use computer software to produce building designs, manage project participation and conduct general personal business administration			
16.	Download and import blocks for furniture layout			
17.	Adjust size and scale according to plan			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		



## Knowledge Assessment

<b>Title of Qualification:</b> National Certificate of level 5 in Computer Aided Design & Manufacturing (CAD/CAM Supervisor)	<b>CS Code:</b>	<b>Level:</b> 05	<b>Version:</b> 01
<b>Competency Standard Title:</b> Develop Basic CNC Code for Milling Machine Develop Advance 3D Modelling using CREO Parametric /Solid Develop Part Assembly using CREO Parametric Perform CAM Operation using Power Mill Apply Animation and Render3D Model using Lumion Develop 3D Model Using Autodesk 3ds Max Design a Basic Project using BIM Technology Implement a design for basic project using BIM Technology Plan a Project in Primavera P6 Develop a Basic Interior House Plan Using Blocks Develop Entrepreneurial Skills Coordinate a Work Team Implement Green skills	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b> 30 min		

Guidance for Candidate	<b>To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.</b>
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Candidate Details	Name: ..... Registration/Roll Number: ..... Candidate Signature:.....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor: ..... Assessor's code: ..... Signature of the Assessor:.....

Question	Candidate's answer
Answer these questions.	

Question	Candidate's answer
Answer these questions.	
1. What are Animation constraints?	
2. Enlist different types of Assembly	
3. Enlist different view of drawings	
4. What is CREO?	
5. What is Sweep & Helical Sweep?	

## Annexure -I

### Task A:

**Develop advance 3-D model of part assembly using CREO parametric as per instructions given below:**

Build this assembly in SolidWorks. It contains 3 components: Base, Yoke, Adjusting Pin. Apply the MMGS unit system.

**Material:** 1060 Alloy for all components. **Density** = 0.0027g/mm<sup>3</sup>

**Base:** The distance between the front face of the Base and the front face of the Yoke = 60mm.

**Yoke:** The Yoke fits inside the left and right square channels of the Base component, (no clearance).

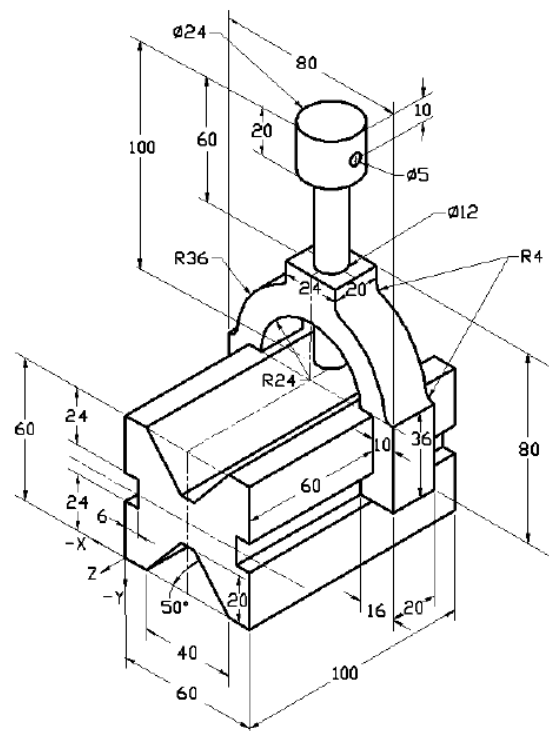
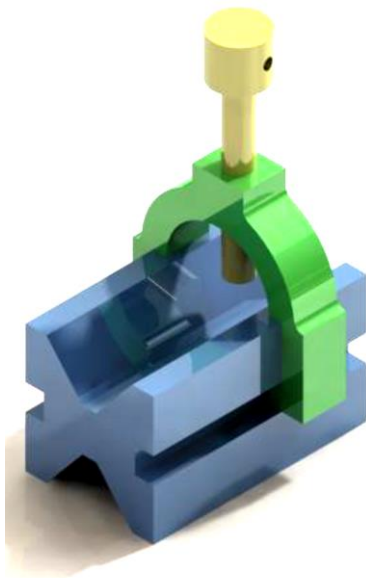
The top face of the Yoke contains a Ø12mm through-all hole.

**Adjusting Pin:** The bottom face of the Adjusting Pin head is located 40 mm from the top face of the Yoke component. The Adjusting Pin component contains a Ø5mm through all hole.

**1- What is the center of mass of the assembly with respect to the illustrated coordinate system?**

- a)  $X=-30.00$   $Y=-40.16$   $Z=-40.16$   
b)  $X=30.00$   $Y=40.16$   $Z=-43.82$   
c)  $X=-30.00$   $Y=-40.16$   $Z=50.20$   
d)  $X=30.00$   $Y=40.16$   $Z=-53.82$

**2- What is mass of each component?**



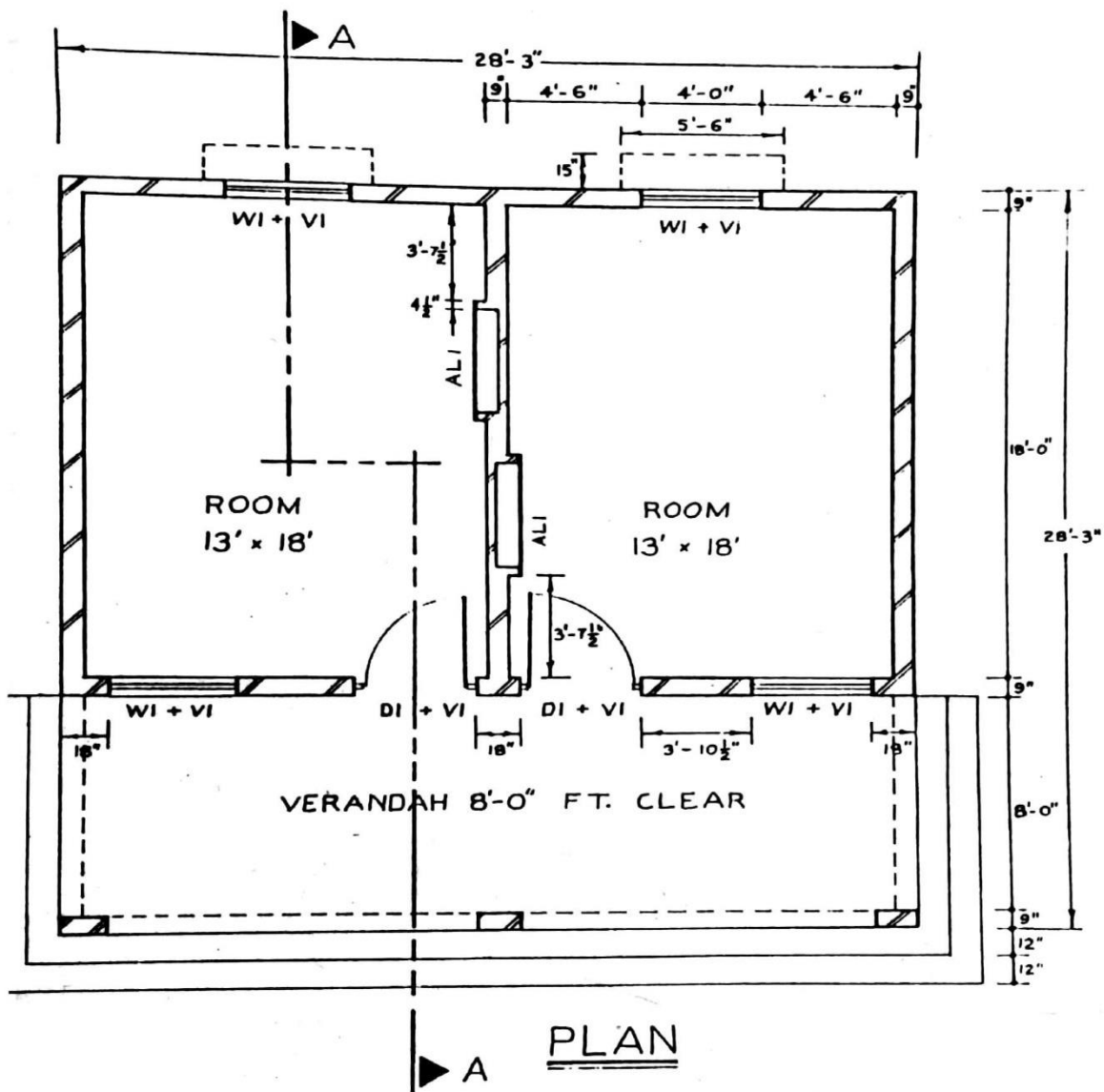
## Annexure -II

### Task B:

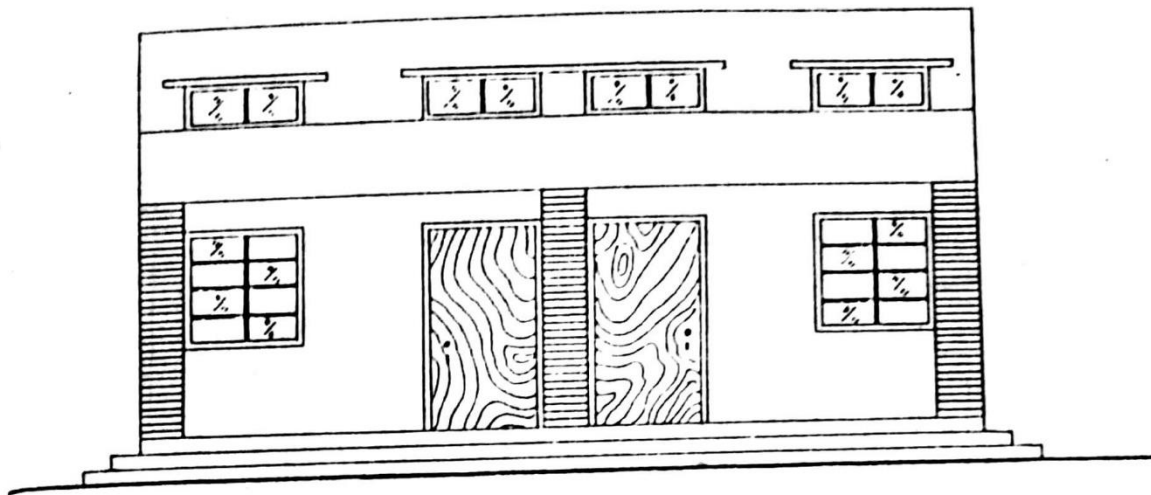
Manage construction project in Primavera P6 as per instructions are given below:

Perform following activities:

1. Link all the activities involved in the construction of the project.
2. Determine the total duration required for the project construction.
3. Determine the Critical Path for the project schedule.
4. Assign the resources in a way that helps in reducing the time duration and cost of the project that makes it economical.
5. Keep a track of the scheduled and the on-site construction.







## ELEVATION

Elevation of the Building