



Skills for Employment Investment Program (SEIP)

ASSESSMENT TOOL FOR CAD-CAM DESIGN AND PROGRAMMING *(LIGHT ENGINEERING SECTOR)*

Finance Division, Ministry of Finance
Government of the People's Republic of Bangladesh

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PART A – THE ASSESSOR

Instructions to Assessor

Assessment is the process of identifying a candidate's skills and knowledge set against the industry established standards in the workplace. It requires the candidate to consistently and over time demonstrate skills, knowledge and attitude that enable confident completion of workplace tasks in a variety of situations.

In judging assessment evidence, the assessor must ensure that the evidence is:

- authentic (the candidate's own work)
- valid (directly related to the current version of the endorsed competency standard)
- reliable (show that the candidate consistently meets the endorsed unit of competency)
- current (reflects the candidate's current capacity to perform the aspect of work covered by the endorsed unit of competency)
- sufficient (covers the full range of elements in the relevant unit of competency)

There are a number of assessment methods that may be employed including but not limited to:

- written examination
- oral questioning
- practical demonstration

A single unit of competency may be assessed or a group of units of competency may be assessed, either in an actual workplace or a simulated workplace environment.

Conducting Assessment

Prior to commencement of assessment, candidates must have the tasks clearly explained to them. Also, the assessor should provide candidates with clear advice and information about the:

- date, time and place for assessment
- structure of assessment
- number of times performance must be demonstrated or observed
- amount or type of assistance candidates can expect
- assessment environment
- resources required for assessment
- performance standards or benchmarks relevant to the qualification

As well as informing the candidate of what they will be required to do during the assessment, the assessor will also need to explain what evidence they will need to provide in response to the various assessment tasks.

If a candidate is required to submit evidence, any explanation must include specific guidance on:

- what to include as evidence
- how to present the evidence
- how to submit the evidence and to whom

Assessing Competence

Competency-based assessment does not award grades, but simply identifies if the candidate has the skills, knowledge and attitudes to undertake the required task to the specified standard.

Therefore, when assessing competency an assessor has two possible results (assessment decisions) that can be awarded:

- Competent (C)
- Not Yet Competent (NYC)

Competent (C)

If the candidate is able to successfully answer and demonstrate what is required to the expected standard of the assessment criteria, they will be deemed as 'Competent'.

The assessor will award 'Competent' if they feel the candidate has the necessary skills, knowledge and attitudes in all assessment tasks for a given package.

Not Yet Competent (NYC)

If the candidate is unable to answer and demonstrate competency to the expected standard, they will be deemed to be 'Not Yet Competent'.

This does not mean the candidate will need to complete all the assessment tasks again. When applying for reassessment, the focus will be on the specific assessment tasks that were not performed to the required standard.

The candidate may be required to:

- (a) undertake further training or instruction
- (b) undertake the specific assessment task again until they are deemed to be competent

Recording Assessment Information

When all assessment tasks are concluded, the evidence summary sheet should be completed, signed by all parties, and any outstanding activities or issues actioned.

The assessor should ensure that all appropriate forms are completed and signed by all parties.

CHECKLIST FOR ASSESSOR

Prior to the assessment I have:	Tick (✓)	Remarks
Ensured the candidate is informed about the venue and schedule of assessment.		
Received current copies of the assessment criteria to be assessed, assessment plan and evidence plan.		
Reviewed the assessment criteria and evidence plan to ensure I clearly understood the instructions and the requirements of the assessment process.		
Identified and accommodated any special needs of the candidate.		
Checked the set-up and resources for the assessment.		
During the assessment I have:		
Introduced myself and confirmed identities of candidates.		
Collected the admission slips.		
Put candidates at ease by being friendly and helpful.		
Checked completed self-assessment guide.		
Explained to candidates the purpose, context and benefits of the assessment.		
Ensured candidates understood the assessment process and the assessment procedure.		
Provided candidates with an overview of the assessment criteria to be used.		
Gave specific and clear instructions to the candidates.		
Observed carefully the specified time limits provided in the assessment package.		
Stayed at the assessment area during the entire duration of the assessment activity.		
Ensured notes are made on unusual conditions or situations during the assessment and include these in the report.		
Did not provide any assistance during the assessment or indicated in any way whether the candidate is or is not performing the activity correctly (intervened only for health and safety reasons).		

Implemented the evidence gathering process and ensured its validity, reliability, fairness and flexibility.		
Collected appropriate evidence and matched relevance to the elements, performance criteria, range of variables and evidence guide in the relevant units of competency.		
Explained the results reporting procedure to the candidate.		
Encouraged candidates to seek clarifications if in doubt about the pre- and post-assessment activity procedures.		
Asked candidates for feedback on the assessment.		
Explained legal, health and safety, and ethical issues, if applicable.		
After the assessment I have:		
<p>Provided feedback on the assessment decision. This includes the following:</p> <ul style="list-style-type: none"> ▪ clear and constructive feedback on the assessment decision ▪ information on ways of addressing any identified gaps in competency revealed by the assessment ▪ opportunity to discuss the assessment process and outcome ▪ information on reassessment process (if necessary) ▪ information on appeal (if necessary) 		
<p>Prepared the necessary assessment reports. This includes the following:</p> <ul style="list-style-type: none"> ▪ record the assessment decision using the prescribed rating sheet ▪ maintain records of the assessment procedures, evidence collected and assessment decision ▪ endorse assessment decision to BTEB ▪ prepare recommendations for the issuance of certificate 		
Thanked candidate for participating in the assessment.		

Assessment Evidence Guide

The purpose of assessment is to confirm that an individual can perform to the standards expected by in the workplace, as expressed in the competency standards.

To attain the certificate of **CAD/CAM Design and Programming**, a candidate must demonstrate competent skill and knowledge in all the units of competency listed below. Upon successful completion of all assessment activities, a candidate shall be awarded with a certificate.

CODE	UNIT OF COMPETENCY
Generic Competencies	
SEIP-LE-CAD-01-G	Use basic mathematical concepts
SEIP-LE-CAD-02-G	Carry out workplace interaction
SEIP-LE-CAD-03-G	Operate in a team environment
SEIP-LE-CAD-04-G	Apply basic IT skills
Sector-specific Competencies	
SEIP-LE-CAD-01-S	Apply occupational health and safety (OHS) practice in the workplace
SEIP-LE-CAD-02-S	Read and interpret sketches and drawings
SEIP-LE-CAD -03-S	Use hand and power tools
SEIP-LE-CAD -04-S	Apply quality system
Occupation-specific Competencies	
SEIP-LE-CAD-01-O	Create mechanical drawing
SEIP-LE-CAD-02-O	Carry out CNC lathe machine operations
SEIP-LE-CAD-03-O	Carry out CNC milling machine operations
SEIP-LE-CAD-04-O	Develop 3D model using CAD software
SEIP-LE-CAD-05-O	Perform CAM programming

Assessment Evidence Plan

An assessment evidence plan is a document that assists in establishing what evidence needs to be collected by the assessor to ensure that the candidate meets all the appropriate requirements of the competency standard. It usually contains a record of:

- evidence requirements as set out in the competency standard
- who will collect the evidence
- time period needed to collect the evidence

Occupation:	CAD/CAM Design and Programming					
Unit Name:	Use basic mathematical concepts					
Unit Code:	SEIP-LE-CAD-01-G					
Assessment Method:	P	O	W			
	Performance <i>(including demonstration and observation)</i>	Oral questioning	Written examination <i>(including short-answer, multiple choice, and true or false questions)</i>			
Element	Performance Criteria			P	O	W
1. Identify calculation requirements in the workplace	1.1. Calculation requirements are identified from workplace information.			✓		
	1.2. Mathematical problems are constructed from workplace.			✓		
2. Select appropriate mathematical methods/concepts for the calculation	2.1. Appropriate method is selected to carry out calculation requirements.			✓		✓
	2.2. Constructed mathematical problems are solved with appropriate method.			✓		✓
3. Use tools and instrument to perform calculations	3.1. Tools and instruments required for computation are identified.			✓		
	3.2. Calculation is performed using appropriate tools and equipment accurately.			✓		

Occupation:	CAD/CAM Design and Programming					
Unit Name:	Carry out workplace interaction					
Unit Code:	SEIP-LE-CAD-02-G					
Assessment Method:	P	O	W			
	Performance <i>(including demonstration and observation)</i>	Oral questioning	Written examination <i>(including short-answer, multiple choice, and true or false questions)</i>			
Element	Performance Criteria			P	O	W
1. Interpret workplace communication and etiquette	1.1. Workplace codes of conduct are interpreted as per organisational guidelines.				✓	
	1.2. Appropriate lines of communication are			✓		

	maintained with supervisors and colleagues.			
	1.3. Workplace interactions are conducted in a courteous manner to gather and convey information.	✓		
	1.4. Workplace procedures and matters are comprehended.	✓		
2. Read and understand workplace documents	2.1. Workplace documents are interpreted correctly.		✓	
	2.2. Visual information/symbols/signage are understood correctly and followed.	✓		
	2.3. Specific and relevant information are accessed from appropriate sources.	✓		
	2.4. Appropriate medium is used to transfer information and ideas.	✓		
3. Participate in workplace meetings and discussions	3.1. Team meetings are attended on time.		✓	
	3.2. Meeting procedures and etiquette are followed.		✓	
	3.3. Active participation is ensured, opinions are expressed and heard.		✓	
	3.4. Inputs are provided and interpreted in line with the meeting purpose.		✓	
4. Practice professional ethics at work	4.1. Responsibilities as a team member are performed.	✓		
	4.2. Tasks are performed in accordance with workplace procedures.	✓		
	4.3. Confidentiality is maintained.		✓	
	4.4. Inappropriate and conflicting situations are avoided.	✓	✓	

Occupation:	CAD/CAM Design and Programming					
Unit Name:	Operate in a team environment					
Unit Code:	SEIP-LE-CAD-03-G					
Assessment Method:	P	O	W			
	Performance (including demonstration and observation)	Oral questioning	Written examination (including short-answer, multiple choice, and true or false questions)			
Element	Performance Criteria			P	O	W
1. Identify team goals and work processes	1.1. Roles and objectives of the team are identified and interpreted.		✓			
	1.2. Roles and responsibilities of team members are identified and interpreted.				✓	

2. Identify own role and responsibilities within team	2.1. Personal role and responsibilities are identified within the team environment.	✓		
	2.2. Reporting relationships are interpreted within team and external to team.		✓	
3. Communicate and co-operate with team members	3.1. Other teammates' tasks are identified and support provided when requested.	✓		
	3.2. The team is encouraged through sharing information or expertise, working together to solve problems, and putting team success first.	✓		
	3.3. Views and opinions of other team members are interpreted and respected.	✓		
4. Practice problem solving within the team	4.1. Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems.			✓
	4.2. A range of solutions and courses of action are identified together with benefits, costs, and risks associated with each.			✓
	4.3. The good ideas of others to help develop solutions are recognised and advice sought from those who have solved similar problems.			✓
	4.4. It is looked beyond the obvious and not stopped at the first answers.		✓	

Occupation:	CAD/CAM Design and Programming					
Unit Name:	Apply basic IT skills					
Unit Code:	SEIP-LE-CAD-04-G					
Assessment Method:	P	O	W			
	Performance (including demonstration and observation)	Oral questioning	Written examination (including short-answer, multiple choice, and true or false questions)			
Element	Performance Criteria			P	O	W
1. Identify and use most commonly used IT tools	1.1. History of information technology (IT) is identified and summarised.			✓	✓	
	1.2. Commonly used IT tools are identified and described.			✓		
2. Understand use of computer	2.1. Basic parts of a computer are identified.			✓		
	2.2. Turning on and off technique of a computer is performed.			✓		
	2.3. Working environment, functions and features of operating system is interpreted.				✓	
	2.4. Simple trouble-shooting techniques are applied.			✓		

3. Work with word processing application	3.1. Word processing application appropriate to perform activity is operated.		✓	
	3.2. Basic typing technique to document is applied.			✓
	3.3. Word processing techniques to document are employed.		✓	
	3.4. Personal CV writing using suitable word processing techniques is practiced.			✓
	3.5. Saving and retrieving technique of a document is used.	✓		
4. Access email and search the internet	4.1. Use of email account in online environment is explained.		✓	
	4.2. Writing and sending of workplace emails is completed.			✓
	4.3. Different browsers to work online are identified and selected.		✓	
	4.4. Browse different web portals and apply proper search techniques.		✓	

Occupation:	CAD/CAM Design and Programming					
Unit Name:	Apply occupational health and safety (OHS) practice in the workplace					
Unit Code:	SEIP-LE-CAD-01-S					
Assessment Method:	P	O	W			
	Performance (including demonstration and observation)	Oral questioning	Written examination (including short-answer, multiple choice, and true or false questions)			
Element	Performance Criteria			P	O	W
1. Identify OHS policies and procedures	1.1. OHS policies and safe operating procedures are interpreted.				✓	
	1.2. Safety signs and symbols are identified and followed.	✓				
	1.3. Response, evacuation procedures and other contingency measures are interpreted correctly.		✓			
2. Apply personal health and safety practices	2.1. OHS policies and procedures are applied in the workplace including personal protective equipment (PPE).	✓				
	2.2. Common health issues are recognised.		✓			
	2.3. Common safety issues are identified.	✓				
3. Report hazards and risks	3.1. Hazards and risks are identified.	✓				
	3.2. Hazards and risks assessment and controls are interpreted.	✓				

4. Respond to emergencies	4.1. Respond to alarms and warning devices.		✓	
	4.2. Emergency response plans and procedures are responded to.		✓	
	4.3. First aid procedures during emergency situations are identified.		✓	

Occupation:	CAD/CAM Design and Programming					
Unit Name:	Read and interpret sketches and drawings					
Unit Code:	SEIP-LE-CAD-02-S					
Assessment Method:	P	O	W			
	Performance (including demonstration and observation)	Oral questioning	Written examination (including short-answer, multiple choice, and true or false questions)			
Element	Performance Criteria			P	O	W
1. Interpret information and specifications	1.1. Appropriate manuals for work activity are identified and collected.			✓		
	1.2. Information and specifications in the manuals is interpreted and applied.			✓		
2. Read and interpret sketches and drawings	2.1. Relevant sketches and drawings are identified for job requirement.			✓		
	2.2. Key terms and abbreviations are identified and interpreted.			✓		
	2.3. Signs and symbols are identified and interpreted.			✓		
	2.4. Schedules, dimensions, sketches, drawings and specifications are correctly read and interpreted.			✓		

Occupation:	CAD/CAM Design and Programming					
Unit Name:	Use hand and power tools					
Unit Code:	SEIP-LE-CAD-03-S					
Assessment Method:	P	O	W			
	Performance (including demonstration and observation)	Oral questioning	Written examination (including short-answer, multiple choice, and true or false questions)			
Element	Performance Criteria			P	O	W
1. Identify and inspect hand and power tools	1.1. Appropriate hand and power tools are identified.			✓		
	1.2. Application of hand and power tools is recognised.				✓	

	1.3. Usability of hand and power tools is checked and verified.	✓		
2. Use hand tools properly and safely	2.1. Appropriate hand tools are selected.	✓		
	2.2. Safety precautions are ensured before using hand tools.	✓		
	2.3. Unsafe or faulty hand tools are identified and marked for repair.	✓		
	2.4. Measuring tools are checked and calibrated before use.	✓		
	2.5. Use hand tools properly and safely to perform work activity.	✓		
3. Operate power tools properly and safely	3.1. Appropriate power tools are selected.	✓		
	3.2. Power supply outlet and electrical cord are inspected and confirmed safe for use in accordance with established workplace safety requirements.	✓		
	3.3. Safety precautions are ensured before using power tools in accordance with manufacturer's operating specification.	✓		
	3.4. Proper sequence of operation applied for using power tools.	✓		
	3.5. Unsafe or faulty power tools are identified and marked for repair.	✓		
	3.6. Operate power tools properly and safely to perform work activity.	✓		
4. Clean and maintain hand and power tools	4.1. Dust and foreign matter is removed from hand and power tools in accordance to workplace standards.	✓		
	4.2. Condition of hand and power tools is checked after use and reported.	✓		
	4.3. Appropriate lubricant is applied after use and prior to storage.	✓		
	4.4. Measuring tools are checked and calibrated after use.	✓		
	4.5. Defective hand and power tools are inspected and repaired or replaced.	✓		
	4.6. Hand and power tools are stored and secured in accordance with workplace requirements.	✓		

Occupation:	CAD/CAM Design and Programming
Unit Name:	Apply quality system
Unit Code:	SEIP-LE-CAD-04-S

Assessment Method:	P	O	W			
	Performance (including demonstration and observation)	Oral questioning	Written examination (including short-answer, multiple choice, and true or false questions)			
Element	Performance Criteria			P	O	W
1. Work within a quality system	1.1. Instructions and procedures are strictly followed in accordance with quality improvement system.		✓			
	1.2. Duties are performed in accordance with demand of quality improvement system.		✓			
	1.3. Defects are detected and reported according to standard operating procedures.		✓			
	1.4. Quality service is ensured and delivered to customer in providing a product or service.		✓			
2. Apply and monitor quality system improvement	2.1. Performance measurement systems are identified.			✓		
	2.2. Specifications and standard operating procedure are identified and established.			✓		
	2.3. Performance is assessed at regular intervals.		✓			
	2.4. Defects are detected and reported to authority according to standard operating procedure.		✓			
	2.5. Process improvement procedures are contributed to and implemented.		✓			
	2.6. Improvement of internal/external customer and supplier relationships is contributed to.			✓		
	2.7. Performance of operation or quality of product or service is monitored to ensure customer satisfaction.		✓			
3. Apply standard procedures for each job	3.1. Concept of supplying product or service to meet the customer's requirements is understood and applied accordingly.			✓		
	3.2. Responsibility is taken for quality of own work.		✓			
	3.3. Quality system procedures for each job are followed.		✓			
	3.4. Conformance to specification is ensured in every case at all situations.		✓			

Occupation:	CAD/CAM Design and Programming		
Unit Name:	Create mechanical drawing		
Unit Code:	SEIP-LE-CAD-01-O		
Assessment Method:	P	O	W
	Performance (including	Oral questioning	Written examination (including short-answer,

	<i>demonstration and observation)</i>		<i>multiple choice, and true or false questions)</i>		
Element	Performance Criteria		P	O	W
1. Identify drawing	1.1.	Job specification and instructions are identified and followed.	✓		
	1.2.	Symbols in technical drawing are identified and interpreted.	✓	✓	
	1.3.	Technical drawing is read and interpreted.	✓		
	1.4.	Dimensions are identified as appropriate.		✓	
	1.5.	Components, assemblies, objects and materials are identified.		✓	
	1.6.	Tolerance, limits and fits are identified in technical drawing.			✓
2. Create drawing	2.1.	Drawing is created accurately.	✓		
	2.2.	Objects or parts are drawn appropriately.	✓		
	2.3.	Dimensions are clearly specified in drawing.	✓		
	2.4.	Base line or datum points are specified, as required.	✓		
	2.5.	Instructions are included in drawing.	✓		

Occupation:	CAD/CAM Design and Programming				
Unit Name:	Carry out CNC lathe machine operations				
Unit Code:	SEIP-LE-CAD-02-O				
Assessment Method:	P	O	W		
	Performance <i>(including demonstration and observation)</i>	Oral questioning	Written examination <i>(including short-answer, multiple choice, and true or false questions)</i>		
Element	Performance Criteria		P	O	W
1. Set-up CNC lathe machine	1.1.	Oil and coolant is checked as per manufacturer's specification.	✓		
	1.2.	Air and hydraulic pressure is checked as per manufacturer's specification.	✓		
	1.3.	Machine zero point is set to the required position.	✓		
	1.4.	Cutting tools are set according to required sequence of operation.	✓		
	1.5.	Clamping devices are set and tightened according to standard operating procedures.	✓		
	1.6.	Tool set-up is performed as per standard	✓		

		operating procedures.			
		1.7. Work piece is mounted and centred on clamping device to required level of accuracy as per workplace procedures.	✓		
2.	Download and input programme	2.1. Programme is downloaded and inputted into the machine using appropriate device.	✓		
		2.2. Programme is simulated to determine the correctness of the tool path and other work parameters.	✓		
3.	Perform CNC lathe machine operations	3.1. Work piece is mounted as per standard operating procedures.	✓		
		3.2. CNC lathe operations are performed to produce component as per programme.	✓		
		3.3. Corrective measures are performed, if necessary.	✓		
4.	Check and measure work piece	4.1. Work piece is checked and measured against specification using appropriate methods and measuring tools.	✓		
		4.2. Defective work pieces are marked, recorded and reported for proper action.	✓		

Occupation:	CAD/CAM Design and Programming					
Unit Name:	Carry out CNC milling machine operations					
Unit Code:	SEIP-LE-CAD-03-O					
Assessment Method:	P	O	W			
	Performance (including demonstration and observation)	Oral questioning	Written examination (including short-answer, multiple choice, and true or false questions)			
Element	Performance Criteria			P	O	W
1. Set-up CNC milling machine	1.1. Oil and coolant is checked as per manufacturer's specification.			✓		
	1.2. Air and hydraulic pressure is checked as per manufacturer's specification.			✓		
	1.3. Machine zero point is set to the required position.			✓		
	1.4. Cutting tools are set according to required sequence of operation.			✓		
	1.5. Clamping devices are set and tightened according to standard operating procedures.			✓		
	1.6. Tool set-up is performed as per standard operating procedures.			✓		
	1.7. Work piece is mounted and centred on clamping device to required level of accuracy as per workplace procedures.			✓		

2. Download and input programme	2.1. Programme is downloaded and inputted into the machine using appropriate device.	✓		
	2.2. Programme is simulated to determine the correctness of the tool path and other work parameters.	✓		
3. Perform CNC milling machine operations	3.1. Work piece is mounted as per standard operating procedures.	✓		
	3.2. CNC milling operations are performed to produce component as per program.	✓		
	3.3. Corrective measures are performed, if necessary.	✓		
4. Check and measure work piece	4.1. Work piece is checked and measured against specification using appropriate methods and measuring tools.	✓		
	4.2. Defective work pieces are marked, recorded and reported for proper action.	✓		

Occupation:	CAD/CAM Design and Programming					
Unit Name:	Develop 3D model using CAD software					
Unit Code:	SEIP-LE-CAD-04-O					
Assessment Method:	P	O	W			
	Performance (including demonstration and observation)	Oral questioning	Written examination (including short-answer, multiple choice, and true or false questions)			
Element	Performance Criteria			P	O	W
1. Prepare CAD environment	1.1. Instructions for developing CAD environment are identified and followed.			✓		
	1.2. CAD package is installed as per standard operating procedure.			✓		
	1.3. Screen display areas and basic parameters are set as per job specification.			✓		
2. Produce 2D drawing	2.1. Sketch tools are identified and selected for 2D drawing.			✓		
	2.2. Sketch modified tools are identified and selected for 2D drawing.			✓		
	2.3. 2D sketch relations are identified and explained.				✓	
	2.4. 2D drawing is created.			✓		
	2.5. CAD drawing is reviewed and modified, as necessary.			✓		
3. Create 3D model	3.1. Features tools are identified and selected for 3D model.			✓		
	3.2. Direct editing tools are identified and selected for			✓		

	3D model.			
	3.3. 3D model is created.	√		
	3.4. 3D model is reviewed and modified, as necessary.	√		
4. Save and print drawing	4.1. 2D drawing is generated from 3D model.	√		
	4.2. Drawing file is saved in designated folder as per standard operating procedure.	√		
	4.3. Drawing file is printed as per standard operating procedure.	√		
	4.4. Software program and computer are shut-down as per standard operating procedure.	√		

Occupation:	CAD/CAM Design and Programming			
Unit Name:	Perform CAM programming			
Unit Code:	SEIP-LE-CAD-05-O			
Assessment Method:		O	W	
	Performance (including demonstration and observation)	Oral questioning	Written examination (including short-answer, multiple choice, and true or false questions)	
Element	Performance Criteria	P	O	W
1. Prepare CAM environment	1.1. Materials, instructions and standard operating procedure are obtained according to job requirement.	√		
	1.2. CAM package is installed as per standard operating procedure.	√		
	1.3. System parameters are identified and selected according to job requirement.	√		
2. Carry out CAM programming	2.1. CAD model is oriented.	√		
	2.2. Reference point is established based on job requirement.	√		
	2.3. Stock set-up is performed.	√		
	2.4. Cutting tools are identified and selected.	√		
	2.5. Sequential toolpaths are identified, generated and verified.	√		
	2.6. NC programme is generated.	√		
3. Load and run programme	3.1. Programme is loaded using appropriate device.	√		
	3.2. Dry run/simulation is performed in machine as per standard operating procedure.	√		

	3.3. Programme is executed to produce work piece.	✓		
	3.4. Problems encountered are recorded and reported to appropriate authority as per standard operating procedure.	✓		
	3.5. Equipment is cleaned and maintained as per standard operating procedure.	✓		

PART B – THE CANDIDATE

Instructions to Candidate

To be assessed as competent, you must provide evidence which demonstrates that you can perform to the necessary standard the various elements of this unit of competency that comprise of the Certificate in CAD/CAM Design and Programming. Assessment of competency requires you to consistently demonstrate skill, knowledge and aptitude (through a variety of assessment tools such as multiple choice, short-answer questions, oral questioning, workplace observation, and practical demonstration) that enables confident completion of workplace tasks in a variety of situations.

In judging the evidence, your assessor must ensure that the evidence is:

- authentic (your own work)
- valid (directly related to the current version of the units of competency)
- reliable (consistently demonstrates of your knowledge and skill)
- current (shows your current capacity to perform the work)
- sufficient (covers the full range of elements comprised within the units of competency)

Furthermore, the assessment process must:

- provide for valid, reliable, flexible and fair assessment
- provide for judgment to be made on the basis of sufficient evidence
- offer valid, authentic and current evidence
- include workplace requirements

There are two types of assessment:

1. Knowledge Assessment - is designed to enable assessment against the various *elements* contained within the units of competency through a variety of activities such as multiple choice, short-answer questions, oral questioning. It is essentially examining your theoretical knowledge.

This provides the assessor with substantial evidence of your knowledge and aptitude to perform the work relating to the specific unit of competency, in conjunction with other assessment tools such as workplace observation.

You should complete the knowledge assessment as directed by the assessor and follow all instructions as and when given. If you are unable to complete the knowledge assessment, please speak to the assessor about alternative assessment solutions.

2. Skill Assessment - is designed to enable assessment against the various *performance criteria* contained within the units of competency through, for example, demonstration of skill in a simulated or actual work environment. In essence, it is an examination of your practical ability.

This provides the assessor with substantial evidence of your ability to perform the work relating to the specific unit of competency to the standard expected by industry (the benchmark).

You should complete the skill assessment as directed by the assessor and follow all instructions as and when given, ensuring your own health and safety.

Once you have been assessed as competent against all of the units of competency comprising of the qualification being undertaken, you will be awarded your certificate.

Your assessor will discuss in more detail the requirements for assessment for each unit of competency at the appropriate time.

And please do not panic if you are not assessed as competent on any part of your qualification at your first attempt. Your assessor will discuss with you any identified skill and knowledge gaps, work through those with you and assist you as much as possible in attaining competency.

Self-Assessment Guide

Before undertaking any assessment, you should review the list of skills, knowledge and aptitudes relating to the assessment (drawn from the units of competency, its various elements and performance criteria) to determine whether you have current competency in these areas.

If you believe you can demonstrate the skills and knowledge required and can successfully complete the various assessment activities, you should then proceed to discuss your assessment with the assessor and complete Assessment Agreement.

However, should you not believe, for whatever reason, that you are not able to successfully complete the various assessment activities, then speak with the assessor. The assessor will assist you in identifying any skill and knowledge gaps, work through those with you and assist you as much as possible in attaining competency.

Please complete the self-assessment checklist below and discuss with the assessor.

Qualification:	CAD/CAM Design and Programming	
Units of competency:	<p>Generic units:</p> <p>Use basic mathematical concepts</p> <p>Carry out workplace interaction</p> <p>Operate in a team environment</p> <p>Apply basic IT skills</p> <p>Sector-specific units:</p> <p>Apply occupational health and safety (OHS) practice in the workplace</p> <p>Read and interpret sketches and drawings</p> <p>Use hand and power tools</p> <p>Apply quality system</p> <p>Occupation-specific units:</p> <p>Create mechanical drawing</p> <p>Carry out CNC lathe machine operations</p> <p>Carry out CNC milling machine operations</p> <p>Develop 3D model using CAD software</p> <p>Perform CAM programming</p>	
Instructions:		
<ul style="list-style-type: none"> ▪ Read each of the questions in the left-hand column of the chart ▪ Place a tick (✓) in the appropriate box opposite each question to indicate your answer 		
Can I?	YES	NO
▪ Identify calculation requirements from workplace information		
▪ Construct mathematical problems from workplace		
▪ Select appropriate method to carry out calculation requirement		

▪ Solve constructed mathematical problems with appropriate method		
▪ Identify tools and instruments required for computation		
▪ Perform calculation using appropriate tools and equipment		
▪ Interpret workplace codes of conduct as per organizational guidelines		
▪ Maintain appropriate lines of communication with supervisors and colleagues.		
▪ Conduct workplace interactions in a courteous manner to gather and convey information		
▪ Comprehend workplace procedures and matters		
▪ Interpret correctly workplace documents		
▪ Understand correctly and follow visual information/symbol/signage		
▪ Access specific and relevant information from appropriate sources		
▪ Use appropriate medium to transfer information and ideas		
▪ Attend team meetings on time to ensure active participation		
▪ Follow meeting procedures and etiquette		
▪ Ensure active participation, express and hear opinions		
▪ Respect opinions and ideas of others and their importance in the development of relationships		
▪ Provide and interpret inputs in line with the meeting purpose		
▪ Perform responsibilities as a team member		
▪ Perform tasks in accordance with workplace procedures		
▪ Maintain confidentiality		
▪ Avoid inappropriate and conflicting situations		
▪ Interpret roles and objectives of the team		
▪ Interpret roles and responsibilities of the team members		
▪ Identify personal role and responsibilities within the team environment		
▪ Interpret reporting relationships within team and external to team		
▪ Identify and provide support to other teammates' tasks		
▪ Encourage the team through sharing information or expertise, working together to solve problems putting team success first		
▪ Interpret and respect views and opinions of other team members		
▪ Identify problems faced at the individual and team level and shows insight into the root-causes of the problems		
▪ Identify a range of solutions and courses of action together with benefits, costs, and risks associated with each		

▪ Recognise the good ideas of others to help develop solutions and seek advice from those who've solved similar problems		
▪ Look beyond the obvious and not stop at the first answers		
▪ Identify and summarise history of information technology (IT)		
Identify and describe commonly used IT tools		
▪ Identify basic parts of a computer		
▪ Perform turning on and off technique of a computer		
▪ Interpret working environment, functions and features of operating system		
▪ Apply simple trouble-shooting techniques		
▪ Operate word processing application appropriate to perform activity		
▪ Apply basic typing technique to document		
▪ Employ word processing techniques to document		
▪ Practice personal CV writing using suitable word processing techniques		
▪ Use saving and retrieving techniques of a document		
▪ Explain use of email account in online environment		
▪ Complete writing and sending of workplace emails		
▪ Identify different browsers to work online		
▪ Browse different web portals and apply proper search techniques		
▪ Interpret OSH policies and safe operating procedures		
▪ Identify and follow safety signs and symbols		
▪ Interpret response, evacuation procedures and other contingency measures correctly		
▪ Apply OSH policies and procedures in the workplace including personal protective equipment (PPE)		
▪ Recognise common health issues		
▪ Identify common safety issues		
▪ Identify hazards and risks		
▪ Interpret hazards and risks assessment		
▪ Respond to alarms and warning devices		
▪ Respond to emergency response plans and procedures		
▪ Identify first aid procedures during emergency situations		
▪ Identify and collect appropriate manuals for work activity		
▪ Interpret and apply information and specifications in the manuals		
▪ Identify relevant sketches and drawings for job requirement		

▪ Identify and interpret key terms and abbreviations		
▪ Identify and interpret key terms and techniques		
▪ Read and interpret schedules, dimensions, sketches, drawings and specification correctly		
▪ Identify appropriate hand and power tools		
▪ Recognise application of hand and power tools		
▪ Read and interpret specifications and instructions.		
▪ Identify and select appropriate personal protective equipment		
▪ Identify and follow Job specification and instructions		
▪ Identify and interpret symbols in technical drawing		
▪ Read and interpret technical drawing		
▪ Identify dimensions as appropriate		
▪ Identify components, assemblies, objects and materials		
▪ Identify tolerance, limits and fits in technical drawing		
▪ Create drawing accurately		
▪ Draw objects or parts appropriately		
▪ Clearly specify dimensions in drawing		
▪ Specify base line or datum points, as required		
▪ Include instructions in drawing		
▪ Check oil and coolant as per manufacturer's specification		
▪ Check air and hydraulic pressure as per manufacturer's specification		
▪ Set machine zero point to the required position		
▪ Set cutting tools according to required sequence of operation		
▪ Set and tight clamping devices are according to standard operating procedures		
▪ Perform tool set-up as per standard operating procedures		
▪ Mount and centre work piece on clamping device to required level of accuracy as per workplace procedures		
▪ Download and input programme into the machine using appropriate device		
▪ Simulate programme to determine the correctness of the tool path and other work parameters		
▪ Mount work piece as per standard operating procedures		
▪ Perform CNC lathe operations to produce component as per programme		
▪ Perform corrective measures, if necessary		

▪ Check and measure work piece against specification using appropriate methods and measuring tools		
▪ Mark, record and report defective work pieces for proper action		
▪ Check oil and coolant as per manufacturer's specification		
▪ Check air and hydraulic pressure as per manufacturer's specification		
▪ Set machine zero point to the required position		
▪ Set cutting tools according to required sequence of operation		
▪ Set and tight clamping devices according to standard operating procedures		
▪ Perform tool set-up as per standard operating procedures		
▪ Mount and centre work piece on clamping device to required level of accuracy as per workplace procedures.		
▪ Download and input programme into the machine using appropriate device		
▪ Simulate programme to determine the correctness of the tool path and other work parameters		
▪ Mount work piece as per standard operating procedures		
▪ Perform CNC milling operations to produce component as per programme		
▪ Perform corrective measures, if necessary		
▪ Check and measure work piece against specification using appropriate methods and measuring tools		
▪ Mark, record and report defective work pieces for proper action		
▪ Identify and flow instructions for developing cad environment		
▪ Install CAD package as per standard operating procedure		
▪ Set screen display areas and basic parameters as per job specification		
▪ Identify and select sketch tools for 2D drawing		
▪ Identify and select sketch modified tools for 2D drawing		
▪ Identify and explain 2D sketch relations		
▪ Create 2D drawing		
▪ Review and modify CAD drawing, as necessary		
▪ Identify and select features tools for 3D model		
▪ Identify and select direct editing tools for 3D model		
▪ Create 3D model is created		
▪ Review and modify 3D model, as necessary		
▪ Generate 2D drawing from 3D model		

▪ Save drawing file in designated folder as per standard operating procedure		
▪ Print drawing file as per standard operating procedure		
▪ Shut-down software program and computer as per standard operating procedure		
▪ Obtain materials, instructions and standard operating procedure according to job requirement		
▪ Install CAM package as per standard operating procedure		
▪ Identify and select system parameters according to job requirement		
▪ Orient CAD model		
▪ Establish reference point based on job requirement		
▪ Perform stock set-up		
▪ Select and identify cutting tools		
▪ Identify, generate and verify sequential toolpaths		
▪ Generate NC programme		
▪ Load programme using appropriate device		
▪ Perform dry run/simulation in machine as per standard operating procedure		
▪ Execute programme to produce work piece		
▪ Record and report problems encountered to appropriate authority as per standard operating procedure		
▪ Clean and maintain equipment as per standard operating procedure		
I agree to undertake assessment in the knowledge that the information gathered will only be used for educational and professional development purposes and can only be accessed by concerned assessment personnel and my manager/supervisor.		
Candidate's signature:		Date:

PART C – THE ASSESSMENT

Assessment Agreement – CAD/CAM Design and Programming

The purpose of assessment is to confirm that you can perform to the standards expected in the workplace of an occupation, as expressed in the competency standards (after completion of self-assessment and in agreement with assessor).

To help achieve this, an assessment agreement is required to navigate both you and the assessor through the assessment process.

The assessment agreement is designed to provide a clear understanding of what and how you will be assessed and to nominate the tools that may be used to collect the assessment evidence.

You, the assessor and/or workplace supervisor should agree on the assessment requirements, dates and deadlines.

Therefore, to attain the Certificate of CAD/CAM Design and Programming, you must demonstrate competence in the following units, as established in the assessment agreement:

After successful completion of learning and assessment, you shall be awarded with a certificate.

CODE	UNIT OF COMPETENCY
Generic Competencies	
SEIP-LE-CAD-01-G	Use basic mathematical concepts
SEIP-LE-CAD-02-G	Carry out workplace interaction
SEIP-LE-CAD-03-G	Operate in a team environment
SEIP-LE-CAD-04-G	Apply basic IT skills
Sector-specific Competencies	
SEIP-LE-CAD-01-S	Apply occupational health and safety (OHS) practice in the workplace
SEIP-LE-CAD-02-S	Read and interpret sketches and drawings
SEIP-LE-CAD-03-S	Use hand and power tools
SEIP-LE-CAD-04-S	Apply quality system
Occupation-specific Competencies	
SEIP-LE-CAD-01-O	Create mechanical drawing
SEIP-LE-CAD-02-O	Carry out CNC lathe machine operations
SEIP-LE-CAD-03-O	Carry out CNC milling machine operations
SEIP-LE-CAD-04-O	Develop 3D model using CAD software
SEIP-LE-CAD-05-O	Perform CAM programming

After successful completion of learning and assessment, you shall be awarded with a certificate.

Assessment Agreement	
Occupation:	CAD/CAM Design and Programming
Assessment Centre:	
Candidate Name:	
Assessor Name:	
Unit of Competency	
Generic Competencies	
SEIP-LE-CAD-01-G	Use basic mathematical concepts
SEIP-LE-CAD-02-G	Carry out workplace interaction
SEIP-LE-CAD-03-G	Operate in a team environment
SEIP-LE-CAD-04-G	Apply basic IT skills
Sector-specific Competencies	
SEIP-LE-CAD-01-S	Apply occupational health and safety (OHS) practice in the workplace
SEIP-LE-CAD-02-S	Read and interpret sketches and drawings
SEIP-LE-CAD -03-S	Use hand and power tools
SEIP-LE-CAD -04-S	Apply quality system
Occupation-specific Competencies	
SEIP-LE-CAD-01-O	Create mechanical drawing
SEIP-LE-CAD-02-O	Carry out CNC lathe machine operations
SEIP-LE-CAD-03-O	Carry out CNC milling machine operations
SEIP-LE-CAD-04-O	Develop 3D model using CAD software
SEIP-LE-CAD-05-O	Perform CAM programming
Resources Required for Assessment	
<p>Candidates must have access to the following:</p> <ul style="list-style-type: none"> ▪ copies of activities, questions, projects nominated by the assessor ▪ relevant organisational policies, protocols and procedural documents (if required) ▪ devices or tools to record answers ▪ appropriate actual or simulated workplace ▪ all necessary tools and equipment used in performance of the work-based task ▪ any other resources normally used in the workplace 	
Assessment Instructions	
<p>Candidates should respond to the formative and summative assessments either verbally or in writing as agreed with the assessor. Written responses can be recorded in the spaces provided (if more space is required attach additional pages) or submitted in a word-processed document.</p> <p>If candidates answer verbally, the assessor should record their answers in detail.</p> <p>Candidates should also undertake observable tasks that provide evidence of performance. The assessor must provide instruction to candidates on what is expected during observation and arrange a</p>	

suitable time and location for demonstration of these skills.

Candidates must fully understand what they are required to do to complete these assessment tasks successfully, then sign the declaration.

Performance Standards

To receive a **satisfactory** result for the assessments, candidates must complete all activities, questions, projects, and tasks nominated by the assessor, to the required standard.

Completion of all tasks for a unit of competency, to a satisfactory level, will contribute to an assessment of competence for that specific individual unit (or units if holistic assessment approach is taken).

Successful completion of all the units of competency that comprise of the qualification CAD/CAM Design and Programming, will result in the candidate being issued with the relevant, nationally recognised certificate.

Assessors must clearly explain the required performance standards.

Declaration

I declare that:

- the assessment requirements have been clearly explained to me
- all the work completed towards assessment will be my own
- cheating and plagiarism are unacceptable

Candidate Signature:

Date:

Assessor Signature:

Date:

PART D – ASSESSMENT TOOLS

Specific Instructions to Assessor

Please read carefully and prepare as necessary:

1. The assessor shall (practical demonstration assessment activities):
 - provide the candidate with the necessary tools, equipment, machinery and materials for completion of one (1) set of the following practical demonstration activities:
 - Set A:
 - Make round **workpiece** using CNC lathe machine
 - Make flat **workpiece** using CNC milling machine
 - Write program for CNC milling
 - Set B:
 - Make cylindrical workpiece with knurling using CNC lathe machine
 - Make flat **workpiece** with different holes using CNC milling machine
 - Write program for CNC milling
 - Set C:
 - Make cylindrical workpiece using CNC lathe machine
 - Make flat **workpiece** using CNC milling machine
 - Write program for CNC lathe
 - provide the candidate with the copy of the specific instruction to candidate
 - allow each practical demonstration to be performed within two (2) hours including preparation of the materials
 - ensure that the candidate **FULLY** understands the instructions before proceeding to the performance of the assessment activity
 - allow fifteen (15) minutes for the candidate to familiarise themselves with the resources to be used during the practical demonstrations
 - ensure that the candidate is wearing appropriate personal protective equipment (PPE) before allowing them to proceed with the assessment activity
2. Assessment shall be based on the performance criteria in each of the units of competency. The evidence gathering method shall be comprised of:
 - (a) Written Test (1 hour) – **knowledge evidence**
 - (b) Practical Demonstration (6 hours) – **performance evidence**

The basic machine operation practical demonstration activities will be divided into three (3) tasks (contained in one set):

 - (i) Practical Demonstration 1 (2 hours)
 - (ii) Practical Demonstration 2 (2 hours)
 - (iii) Practical Demonstration 3 (2 hours)
3. Final assessment is your responsibility as the accredited/certified assessor.
4. At the conclusion of each assessment activity, you will provide feedback to the candidate of the assessment result. The feedback will indicate whether the candidate is:

COMPETENT

NOT YET COMPETENT

5. The list of tools, equipment, machinery and materials to be provided for completion of the practical demonstration assessment activities can be found at:
- Set A – Practical Demonstration 1: page 41
 - Set A – Practical Demonstration 2: page 45
 - Set A – Practical Demonstration 3: page 49
 - Set B – Practical Demonstration 1: page 53
 - Set B – Practical Demonstration 2: page 57
 - Set B – Practical Demonstration 3: page 61
 - Set C – Practical Demonstration 1: page 65
 - Set C – Practical Demonstration 2: page 69
 - Set C – Practical Demonstration 3: page 73

Specific Instructions to Candidate

You should respond to the assessment either in writing or verbally as agreed with the assessor. Written responses can be recorded in the spaces provided; if more space is required attach additional pages) or submit a word-processed document.

If you answer verbally, the assessor should record your answers in detail. Please check your recorded answers carefully and thoroughly to ensure that they are accurate.

You may also be undertaking observable activities (i.e. practical demonstration) that provide evidence of performance. The assessor must provide you with clear instructions on what is expected during this type of assessment and arrange a suitable time and location for demonstration of these skills.

To receive a satisfactory result for the assessments, you must complete all of the assessment activities; including questions, projects and tasks nominated by the assessor, to the required standard.

This assessment is based upon the units of competency in CAD/CAM Design and Programming. Using the performance criteria as a benchmark, evidence will be gathered through:

1. Written Test (1 hour) – a variety of multiple-choice, true or false and short answer theory questions to support your competence with regard to the required knowledge (**knowledge evidence**).
2. Practical Demonstration (6 hours) – observable tasks outlined in the elements and performance criteria of the units of competency, completed to support a judgement of satisfactory performance to the required standard (**performance evidence**).

There will be one (1) set of practical demonstration activities to complete. The assessor will direct you as to which 'set' you will be required to complete out of the following:

- Set A:
 - Make round **workpiece** using CNC lathe machine
 - Make flat **workpiece** using CNC milling machine
 - Write program for CNC milling
 - Set B:
 - Make cylindrical workpiece with knurling using CNC lathe machine
 - Make flat **workpiece** with different holes using CNC milling machine
 - Write program for CNC milling
 - Set C:
 - Make cylindrical workpiece using CNC lathe machine
 - Make flat **workpiece** using CNC milling machine
 - Write program for CNC lathe
3. The assessor will provide all necessary tools, equipment, machinery and materials required to complete each assessment activity.
 4. These assessments cover all units of competency for CAD/CAM Design and Programming.
 5. The assessor will provide you with feedback of your performance after completion of each assessment activity. This feedback shall indicate whether you are:

COMPETENT

NOT YET COMPETENT

6. Complete of all assessment activities, to a satisfactory level, will contribute to a final assessment of competence.

Written Test

WRITTEN TEST - INSTRUCTIONS	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD/CAM Design and Programming
Unit of Competency	
Generic Competencies	
SEIP-LE-CAD-01-G	Use basic mathematical concepts
SEIP-LE-CAD-02-G	Carry out workplace interaction
SEIP-LE-CAD-03-G	Operate in a team environment
SEIP-LE-CAD-04-G	Apply basic IT skills
Sector-specific Competencies	
SEIP-LE-CAD-01-S	Apply occupational health and safety (OHS) practice in the workplace
SEIP-LE-CAD-02-S	Read and interpret sketches and drawings
SEIP-LE-CAD-03-S	Use hand and power tools
SEIP-LE-CAD-04-S	Apply quality system
Occupation-specific Competencies	
SEIP-LE-CAD-01-O	Create mechanical drawing
SEIP-LE-CAD-02-O	Carry out CNC lathe machine operations
SEIP-LE-CAD-03-O	Carry out CNC milling machine operations
SEIP-LE-CAD-04-O	Develop 3D model using CAD software
SEIP-LE-CAD-05-O	Perform CAM programming
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
<p>Read and understand the directions carefully:</p> <ul style="list-style-type: none"> ▪ this written examination is based on the performance criteria from all the units of competency in CAD/CAM Design and Programming ▪ this assessment activity will be used to measure your underpinning knowledge ▪ write your answers on the paper provided ▪ answer all the questions as best as possible ▪ you have 1 (one) hour to complete this test 	

WRITTEN TEST**Multiple Choice**

This is a **multiple-choice** test. Choose the appropriate answer and circle the letter that corresponds with your answer.

1.	What setting gradient allows us to fill an open area?	<ul style="list-style-type: none"> a. Gap b. Tolerance c. Transparency d. Open
2.	Which command converts discrete objects in polyline?	<ul style="list-style-type: none"> a. Union b. Subtract c. Join d. Polyline
3.	A CNC machine tool has a continuous part control both linear and circular along X, Y, Z and control of table rotation about X axis and Z axis, so the machine should be called?	<ul style="list-style-type: none"> a. 2C, L b. 3L, 2C c. 5C d. None of the above
4.	How many grams of raw materials do you have in 25,000 kilograms?	<ul style="list-style-type: none"> a. 250,000,000 b. 250,000 c. 2,500,000 b. 25,000,000
5.	A CNC milling machine would have?	<ul style="list-style-type: none"> a. Point-to-point open loop control only b. Point-to-point closed loop control only c. Contouring control d. None of the above
6.	CNC is not applicable in?	<ul style="list-style-type: none"> a. Drilling b. Milling c. Lathe d. None of the above
7.	For milling, a bilaterally symmetrical 2D profile on metal plate 10 millimetres thick, a CNC milling machine would require the following accessory or attachment?	<ul style="list-style-type: none"> a. Copy milling attachment b. Dividing head c. Reversing table d. None of the above
8.	When using a CNC machine tool, the part program entered into the computer memory?	<ul style="list-style-type: none"> a. Can be used only once b. Can be used again and again c. Can be used again but it has to be modified every time d. Cannot say
9.	The machine tool, in which calculation and setting of the operating conditions like depth of cut, feed, speed are done during the machining by the control system itself, is called?	<ul style="list-style-type: none"> a. Computer Numerical Control System b. Direct Numerical Control System c. Machining Centre System d. Adaptive Control System

10.	Which machine tool reduces the number of set-ups in machining operation, time spent in setting machine tools, and transportation between sections of machines?	a. Computer Numerical Control b. Direct Numerical Control c. Adaptive Control Systems d. Machining Centre
True or False Quiz		
Tick (√) the box corresponding to the correct answer.		
11.	Polite words should be used when conducting official communication through the email.	True <input type="checkbox"/> False <input type="checkbox"/>
12.	Rahim knows that he has a meeting at 9:00 in the morning. It is part of professional ethics to come to the meeting even if he is late by 1 hour. Anyway, the team members will wait for him.	True <input type="checkbox"/> False <input type="checkbox"/>
13.	Wearing PPE helps protect against injury .	True <input type="checkbox"/> False <input type="checkbox"/>
Fill in the Missing Blanks		
Write the word or group of words needed to complete the following sentences.		
14.	CNC machining centre does all the work _____.	
15.	The CNC code that cancels the mirror image coordinates for double turret turning centres is _____.	
Short Answer		
Write a short answer in the space provided (not to exceed more than approximately twenty-five (25) words).		
16.	With CNC turning machine and miscellaneous (M) codes, what does a “M03” represent?	
17.	When referring to CNC programming, what is the program format for circular interpolation in a counter clockwise direction?	
18.	Which CNC code relates to “spindle on” counter clockwise at constant surface speed?	
19.	What is CNC milling?	
20.	What is CNC programming?	

Feedback to candidate:

Assessment decision for this assessment activity:

Competent

Not Yet Competent

Candidate Signature:

Date:

Assessor Signature:

Date:



Written Test - Answers

Answers are highlighted in **bold** and *italics*.

Multiple Choice		
1.	What setting gradient allows us to fill an open area?	a. Gap b. Tolerance c. Transparency d. Open
2.	Which command converts discrete objects in polyline?	a. Union b. Subtract c. Join d. Polyline
3.	A CNC machine tool has a continuous part control both linear and circular along X, Y, Z and control of table rotation about X axis and Z axis, so the machine should be called?	a. 2C, L b. 3L, 2C c. 5C d. None of the above
4.	How many grams of raw materials do you have in 25,000 kilograms?	a. 250,000,000 b. 250,000 c. 2,500,000 d. 25,000,000
5.	A CNC milling machine would have?	a. Point-to-point open loop control only b. Point-to-point closed loop control only c. Contouring control d. None of the above
6.	CNC is not applicable in?	a. Drilling b. Milling c. Lathe d. None of the above
7.	For milling, a bilaterally symmetrical 2D profile on metal plate 10 millimetres thick, a CNC milling machine would require the following accessory or attachment?	a. Copy milling attachment b. Dividing head c. Reversing table d. None of the above
8.	When using a CNC machine tool, the part program entered into the computer memory?	a. Can be used only once b. Can be used again and again c. Can be used again but it has to be modified every time d. Cannot say
9.	The machine tool, in which calculation and setting of the operating conditions like depth of cut, feed, speed are done during the machining by the control system itself, is called?	a. Computer Numerical Control System b. Direct Numerical Control System c. Machining Centre System d. Adaptive Control System
10.	Which machine tool reduces the number of	a. Computer Numerical Control

	set-ups in machining operation, time spent in setting machine tools, and transportation between sections of machines?	b. Direct Numerical Control c. Adaptive Control Systems d. Machining centre
True or False Quiz		
11.	Polite words should be used when conducting official communication through the email.	True ✓ False □
12.	Rahim knows that he has a meeting at 9:00 in the morning. It is part of professional ethics to come to the meeting even if he is late by 1 hour. Anyway, the team members will wait for him.	True □ False ✓
13.	Wearing PPE helps protect against injury .	True ✓ False □
Fill in the Missing Blanks		
14.	CNC machining centre does all the work <u>for milling and drilling machine</u> .	
15.	The CNC code that cancels the mirror image coordinates for double turret turning centres is <u>G69</u> .	
Short Answer		
16.	With CNC turning machine and miscellaneous (M) codes, what does a “M03” represent?	Spindle on in clockwise rotation.
17.	When referring to CNC programming, what is the program format for circular interpolation in a counter clockwise direction?	G17 G03 X_Y_I_J_F_;
18.	Which CNC code relates to “spindle on” counter clockwise at constant surface speed?	N040 M04 S500 G96
19.	What is CNC milling?	CNC milling is a specific form of computer numerical controlled (CNC) machining. Milling itself is a machining process similar to both drilling and cutting, and able to achieve many of the operations performed by cutting and drilling machines. Like drilling, milling uses a rotating cylindrical cutting tool.
20.	What is CNC programming?	Most NC today is computer (or computerized) numerical control (CNC), in which computers play an integral part of the control. In modern CNC systems, end-to-end component design is highly automated using computer-aided design (CAD) and computer-aided manufacturing (CAM) programs.

Set A: Practical Demonstration 1

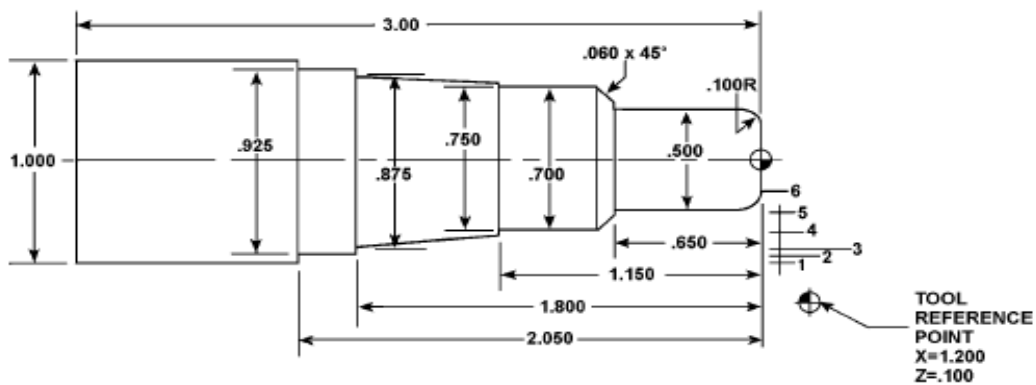
PRACTICAL DEMONSTRATION 1	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD-CAM Design and Programming
Task:	Make round workpiece using CNC lathe machine
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
Read and understand the directions carefully: <ul style="list-style-type: none">▪ this practical demonstration is based on the performance criteria from all or some of the units of competency in CAD-CAM Design and Programming▪ this assessment activity will be used to measure your underpinning skills▪ you will have fifteen (15) minutes to familiarise yourself with the resources to be used▪ you have two (2) hours to complete this demonstration	
Procedure:	
<ul style="list-style-type: none">▪ observe and wear personal protective equipment (PPE) as required for the task to be performed▪ read the specification information provided▪ collect all materials needed to complete the task▪ perform the task within the given time▪ observe and follow all health and safety (OHS) requirements at all times	
Job Specification Information:	
<ol style="list-style-type: none">1. Identify, read and interpret job specifications, drawings and other workplace documents.2. Identify and collect required tools, equipment and materials for the task.3. Inspect worksite for hazards and implement appropriate controls (if necessary).4. Identify and collect appropriate PPE.5. Inspect and check tools and equipment.6. Calculate quantity of materials required as per job specification.7. Prepare machine as per manufacturer's specifications.8. Program CNC lathe machine.9. Cut workpiece as per job specification.	
 Indicates the X Z 0 (zero) location which is the starting point for programming.	
 Indicates the tool-change position.	
A G92 code will reset the axis register position coordinates to this position.	

For a program to run on a machine, it must contain the following codes:

M03 To start the spindle/cutter revolving.
 Sxxx The spindle speed code to set the r/min.
 Fxx The feedrate code to move the cutting tool or workpiece to the desired position.

10. Run program to produce workpiece.
11. Inspect workpiece for quality and identify any defects.
12. Close program and shutdown machine.
13. Clean, maintain and store tools and equipment.
14. Clean workplace and dispose of waste materials.

Drawing, Plan, Diagram or Sketch:



Resources Required:



Tools:	CNC lathe tools (different types)
Equipment:	N/A
Machinery:	CNC lathe machine
Materials:	Mild steel (AISI 1040)
PPE:	Apron Mask Gloves Safety shoes Safety goggles

Set A: Practical Demonstration 1 – Observation Checklist

PRACTICAL DEMONSTRATION 1 – OBSERVATION CHECKLIST		
Candidate Name:		
Assessor Name:		
Qualification:	Certificate in CAD-CAM Design and Programming	
Task:	Make round workpiece using CNC lathe machine	
Assessment Centre:		
Date of Assessment:		
Instructions:	<p>The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate.</p> <p>Performance can be observed in an actual workplace or in a simulated working environment.</p> <p>If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject.</p> <p>The assessment activity (practical demonstration) should:</p> <ul style="list-style-type: none"> ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate 	
OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	No
▪ Identify and follow job specification and instructions	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and interpret symbols in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Read and interpret technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify dimensions as appropriate	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify components, assemblies, objects and materials	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify tolerance, limits and fits in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Create drawing accurately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Draw objects or parts appropriately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Clearly specify dimensions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Specify base line or datum points, as required	<input type="checkbox"/>	<input type="checkbox"/>
▪ Include instructions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check oil and coolant as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>

▪ Check air and hydraulic pressure as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set machine zero point to the required position	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set cutting tools according to required sequence of operation	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set and tight clamping devices are according to standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform tool set-up as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount and centre work piece on clamping device to required level of accuracy as per workplace procedures.	<input type="checkbox"/>	<input type="checkbox"/>
▪ Download and input programme into the machine using appropriate device	<input type="checkbox"/>	<input type="checkbox"/>
▪ Simulate programme to determine the correctness of the tool path and other work parameters	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount work piece as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform CNC lathe operations to produce component as per programme	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform corrective measures, if necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check and measure work piece against specification using appropriate methods and measuring tools	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mark, record and report defective work pieces for proper action	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and machines are cleaned and maintained	<input type="checkbox"/>	<input type="checkbox"/>
▪ Workplace is cleaned	<input type="checkbox"/>	<input type="checkbox"/>
▪ Waste materials are disposed in its designated/proper place	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and finished products are stored safely in an appropriate location in accordance with workplace procedures	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:		
Assessment decision for this assessment activity:		
<input type="checkbox"/> Competent		<input type="checkbox"/> Not Yet Competent
Candidate Signature:		Date:
Assessor Signature:		Date:

Set A: Practical Demonstration 2

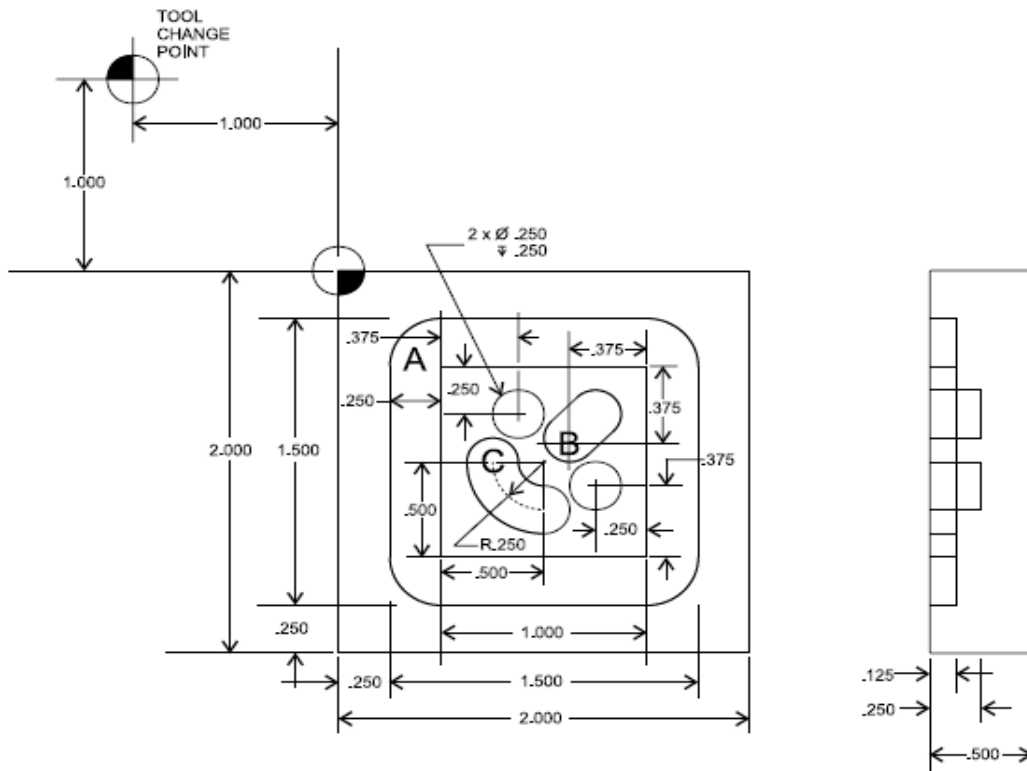
PRACTICAL DEMONSTRATION 2	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD-CAM Design and Programming
Task:	Make flat workpiece using CNC milling machine
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
<p>Read and understand the directions carefully:</p> <ul style="list-style-type: none"> ▪ this practical demonstration is based on the performance criteria from all or some of the units of competency in CAD-CAM Design and Programming ▪ this assessment activity will be used to measure your underpinning skills ▪ you will have fifteen (15) minutes to familiarise yourself with the resources to be used ▪ you have two (2) hours to complete this demonstration 	
Procedure:	
<ul style="list-style-type: none"> ▪ observe and wear personal protective equipment (PPE) as required for the task to be performed ▪ read the specification information provided ▪ collect all materials needed to complete the task ▪ perform the task within the given time ▪ observe and follow all health and safety (OHS) requirements at all times 	
Job Specification Information:	
<ol style="list-style-type: none"> 1. Identify, read and interpret job specifications, drawings and other workplace documents. 2. Identify and collect required tools, equipment and materials for the task. 3. Inspect worksite for hazards and implement appropriate controls (if necessary). 4. Identify and collect appropriate PPE. 5. Inspect and check tools and equipment. 6. Calculate quantity of materials required as per job specification. 7. Prepare machine as per manufacturer's specifications. 8. Program CNC milling machine. 9. Cut workpiece as per job specification. 	
 <p>Indicates the X Z 0 (zero) location which is the starting point for programming.</p>	
 <p>Indicates the tool-change position.</p>	
<p>A G92 code will reset the axis register position coordinates to this position.</p>	

For a program to run on a machine, it must contain the following codes:

- M03 To start the spindle/cutter revolving.
- Sxxx The spindle speed code to set the r/min.
- Fxx The feedrate code to move the cutting tool or workpiece to the desired position.

10. Run program to produce workpiece.
11. Inspect workpiece for quality and identify any defects.
12. Close program and shutdown machine.
13. Clean, maintain and store tools and equipment.
14. Clean workplace and dispose of waste materials.

Drawing, Plan, Diagram or Sketch:



(All dimensions in mm)

Resources Required:

Tools:	CNC milling cutters (different types)
Equipment:	N/A
Machinery:	CNC milling machine
Materials:	Aluminium flat plate
PPE:	Apron Mask Gloves Safety shoes Safety goggles

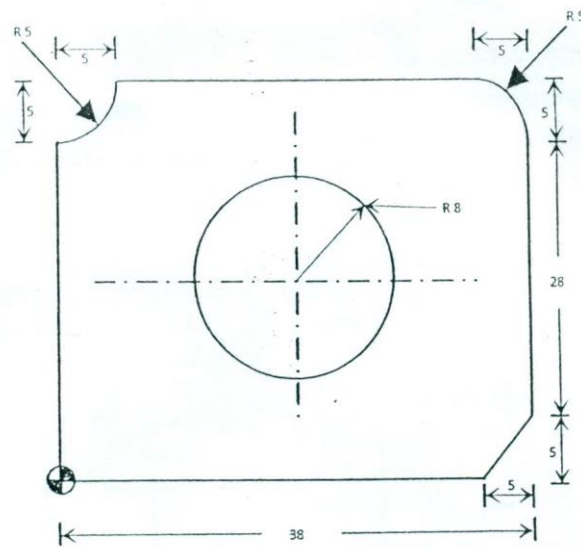
Set A: Practical Demonstration 2 – Observation Checklist

PRACTICAL DEMONSTRATION 2 – OBSERVATION CHECKLIST		
Candidate Name:		
Assessor Name:		
Qualification:	Certificate in CAD-CAM Design and Programming	
Task:	Make flat workpiece using CNC milling machine	
Assessment Centre:		
Date of Assessment:		
Instructions:	<p>The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate.</p> <p>Performance can be observed in an actual workplace or in a simulated working environment.</p> <p>If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject.</p> <p>The assessment activity (practical demonstration) should:</p> <ul style="list-style-type: none"> ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate 	
OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	No
▪ Identify and follow job specification and instructions	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and interpret symbols in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Read and interpret technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify dimensions as appropriate	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify components, assemblies, objects and materials	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify tolerance, limits and fits in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Create drawing accurately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Draw objects or parts appropriately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Clearly specify dimensions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Specify base line or datum points, as required	<input type="checkbox"/>	<input type="checkbox"/>
▪ Include instructions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check oil and coolant as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>

▪ Check air and hydraulic pressure as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set machine zero point to the required position	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set cutting tools according to required sequence of operation	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set and tight clamping devices according to standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform tool set-up as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount and centre work piece on clamping device to required level of accuracy as per workplace procedures.	<input type="checkbox"/>	<input type="checkbox"/>
▪ Download and input programme into the machine using appropriate device	<input type="checkbox"/>	<input type="checkbox"/>
▪ Simulate programme to determine the correctness of the tool path and other work parameters	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount work piece as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform CNC milling operations to produce component as per programme	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform corrective measures, if necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check and measure work piece against specification using appropriate methods and measuring tools	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mark, record and report defective work pieces for proper action	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and machines are cleaned and maintained	<input type="checkbox"/>	<input type="checkbox"/>
▪ Workplace is cleaned	<input type="checkbox"/>	<input type="checkbox"/>
▪ Waste materials are disposed in its designated/proper place	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and finished products are stored safely in an appropriate location in accordance with workplace procedures	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:		
Assessment decision for this assessment activity:		
<input type="checkbox"/> Competent <input type="checkbox"/> Not Yet Competent		
Candidate Signature:		Date:
Assessor Signature:		Date:

Set A: Practical Demonstration 3

PRACTICAL DEMONSTRATION 3	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD-CAM Design and Programming
Task:	Write program for CNC milling
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
Read and understand the directions carefully: <ul style="list-style-type: none">▪ this practical demonstration is based on the performance criteria from all or some of the units of competency in CAD-CAM Design and Programming▪ this assessment activity will be used to measure your underpinning skills▪ you will have fifteen (15) minutes to familiarise yourself with the resources to be used▪ you have two (2) hours to complete this demonstration	
Procedure:	
<ul style="list-style-type: none">▪ observe and wear personal protective equipment (PPE) as required for the task to be performed▪ read the specification information provided▪ collect all materials needed to complete the task▪ perform the task within the given time▪ observe and follow all health and safety (OHS) requirements at all times	
Job Specification Information:	
<ol style="list-style-type: none">1. Identify, read and interpret job specifications, drawings and other workplace documents.2. Identify and collect required tools, equipment and materials for the task.3. Inspect worksite for hazards and implement appropriate controls (if necessary).4. Identify and collect appropriate PPE.5. Inspect and check tools and equipment.6. Workpiece, drawing, model or concept of new design are analysed to produce CAM program.7. Cutting tools are identified and selected as per job specification.8. Sequential toolpaths are identified, generated and verified.9. CNC parameters are identified and selected according to job specification.10. Basic parameters of CNC machine are set.11. Profile, shape, and contour of workpiece is imported using CAD.12. CAM parameters are identified and set.13. Program is loaded using appropriate device.14. Run program simulation.15. Production issues are identified, recorded and reported to appropriate authority.16. Close program and shutdown machine.17. Clean, maintain and store tools and equipment.18. Clean workplace and dispose of waste materials.	

Drawing, Plan, Diagram or Sketch:

(All dimensions in mm)

Resources Required:



Tools:	N/A
Equipment:	Computer CAD Master CAM, EDGE CAM, CATIA
Machinery:	CNC machine
Materials:	Pen/pencil Paper Eraser
PPE:	Apron

Set A: Practical Demonstration 3 – Observation Checklist

PRACTICAL DEMONSTRATION 3 – OBSERVATION CHECKLIST		
Candidate Name:		
Assessor Name:		
Qualification:	Certificate in CAD-CAM Design and Programming	
Task:	Write program for CNC milling	
Assessment Centre:		
Date of Assessment:		
Instructions:	<p>The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate.</p> <p>Performance can be observed in an actual workplace or in a simulated working environment.</p> <p>If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject.</p> <p>The assessment activity (practical demonstration) should:</p> <ul style="list-style-type: none"> ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate 	
OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	No
▪ Identify and follow job specification and instructions	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and interpret symbols in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Read and interpret technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Obtain materials, instructions and standard operating procedure according to job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and flow instructions for developing cad environment	<input type="checkbox"/>	<input type="checkbox"/>
▪ Install CAD package as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set screen display areas and basic parameters as per job specification	<input type="checkbox"/>	<input type="checkbox"/>
▪ Review and modify CAD drawing, as necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and select features tools for 3D model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and select direct editing tools for 3D model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Create 3D model is created	<input type="checkbox"/>	<input type="checkbox"/>

▪ Review and modify 3D model, as necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Generate 2D drawing from 3D model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Save drawing file in designated folder as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Obtain materials, instructions and standard operating procedure according to job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Install CAM package as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and select system parameters according to job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Orient CAD model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish reference point based on job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform stock set-up	<input type="checkbox"/>	<input type="checkbox"/>
▪ Select and identify cutting tools	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify, generate and verify sequential toolpaths	<input type="checkbox"/>	<input type="checkbox"/>
▪ Generate NC programme	<input type="checkbox"/>	<input type="checkbox"/>
▪ Load programme using appropriate device	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform dry run/simulation in machine as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Record and report problems encountered to appropriate authority as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Shut-down software program and computer as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and machines are cleaned and maintained	<input type="checkbox"/>	<input type="checkbox"/>
▪ Workplace is cleaned	<input type="checkbox"/>	<input type="checkbox"/>
▪ Waste materials are disposed in its designated/proper place	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and finished products are stored safely in an appropriate location in accordance with workplace procedures	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:		
Assessment decision for this assessment activity:		
<input type="checkbox"/> Competent		<input type="checkbox"/> Not Yet Competent
Candidate Signature:		Date:
Assessor Signature:		Date:

Set B: Practical Demonstration 1

PRACTICAL DEMONSTRATION 1	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD-CAM Design and Programming
Task:	Make cylindrical workpiece with knurling using CNC lathe machine
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
<p>Read and understand the directions carefully:</p> <ul style="list-style-type: none"> ▪ this practical demonstration is based on the performance criteria from all or some of the units of competency in CAD-CAM Design and Programming ▪ this assessment activity will be used to measure your underpinning skills ▪ you will have fifteen (15) minutes to familiarise yourself with the resources to be used ▪ you have two (2) hours to complete this demonstration 	
Procedure:	
<ul style="list-style-type: none"> ▪ observe and wear personal protective equipment (PPE) as required for the task to be performed ▪ read the specification information provided ▪ collect all materials needed to complete the task ▪ perform the task within the given time ▪ observe and follow all health and safety (OHS) requirements at all times 	
Job Specification Information:	
<ol style="list-style-type: none"> 1. Identify, read and interpret job specifications, drawings and other workplace documents. 2. Identify and collect required tools, equipment and materials for the task. 3. Inspect worksite for hazards and implement appropriate controls (if necessary). 4. Identify and collect appropriate PPE. 5. Inspect and check tools and equipment. 6. Calculate quantity of materials required as per job specification. 7. Prepare machine as per manufacturer's specifications. 8. Program CNC lathe machine. 9. Cut workpiece as per job specification. 	
 Indicates the X Z 0 (zero) location which is the starting point for programming.	
 Indicates the tool-change position.	
<p>A G92 code will reset the axis register position coordinates to this position.</p>	

For a program to run on a machine, it must contain the following codes:

M03 To start the spindle/cutter revolving.
 Sxxx The spindle speed code to set the r/min.
 Fxx The feedrate code to move the cutting tool or workpiece to the desired position.

10. Run program to produce workpiece.
11. Inspect workpiece for quality and identify any defects.
12. Close program and shutdown machine.
13. Clean, maintain and store tools and equipment.
14. Clean workplace and dispose of waste materials.

Drawing, Plan, Diagram or Sketch:



Resources Required:





Tools:	CNC lathe tools (different types)
Equipment:	N/A
Machinery:	CNC lathe machine
Materials:	Mild steel (AISI 1040)
PPE:	Apron Mask Gloves Safety shoes Safety goggles

Set B: Practical Demonstration 1 – Observation Checklist

PRACTICAL DEMONSTRATION 1 – OBSERVATION CHECKLIST		
Candidate Name:		
Assessor Name:		
Qualification:	Certificate in CAD-CAM Design and Programming	
Task:	Make cylindrical workpiece with knurling using CNC lathe machine	
Assessment Centre:		
Date of Assessment:		
Instructions:	<p>The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate.</p> <p>Performance can be observed in an actual workplace or in a simulated working environment.</p> <p>If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject.</p> <p>The assessment activity (practical demonstration) should:</p> <ul style="list-style-type: none"> ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate 	
OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	No
▪ Identify and follow job specification and instructions	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and interpret symbols in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Read and interpret technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify dimensions as appropriate	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify components, assemblies, objects and materials	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify tolerance, limits and fits in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Create drawing accurately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Draw objects or parts appropriately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Clearly specify dimensions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Specify base line or datum points, as required	<input type="checkbox"/>	<input type="checkbox"/>
▪ Include instructions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check oil and coolant as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>

▪ Check air and hydraulic pressure as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set machine zero point to the required position	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set cutting tools according to required sequence of operation	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set and tight clamping devices are according to standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform tool set-up as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount and centre work piece on clamping device to required level of accuracy as per workplace procedures.	<input type="checkbox"/>	<input type="checkbox"/>
▪ Download and input programme into the machine using appropriate device	<input type="checkbox"/>	<input type="checkbox"/>
▪ Simulate programme to determine the correctness of the tool path and other work parameters	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount work piece as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform CNC lathe operations to produce component as per programme	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform corrective measures, if necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check and measure work piece against specification using appropriate methods and measuring tools	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mark, record and report defective work pieces for proper action	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and machines are cleaned and maintained	<input type="checkbox"/>	<input type="checkbox"/>
▪ Workplace is cleaned	<input type="checkbox"/>	<input type="checkbox"/>
▪ Waste materials are disposed in its designated/proper place	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and finished products are stored safely in an appropriate location in accordance with workplace procedures	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:		
Assessment decision for this assessment activity:		
<input type="checkbox"/> Competent <input type="checkbox"/> Not Yet Competent		
Candidate Signature:		Date:
Assessor Signature:		Date:

Set B: Practical Demonstration 2

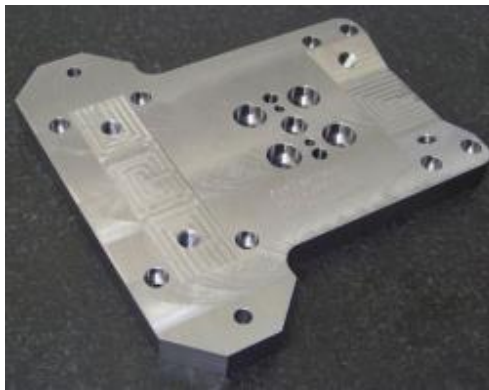
PRACTICAL DEMONSTRATION 2	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD-CAM Design and Programming
Task:	Make flat workpiece with different holes using CNC milling machine
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
<p>Read and understand the directions carefully:</p> <ul style="list-style-type: none"> ▪ this practical demonstration is based on the performance criteria from all or some of the units of competency in CAD-CAM Design and Programming ▪ this assessment activity will be used to measure your underpinning skills ▪ you will have fifteen (15) minutes to familiarise yourself with the resources to be used ▪ you have two (2) hours to complete this demonstration 	
Procedure:	
<ul style="list-style-type: none"> ▪ observe and wear personal protective equipment (PPE) as required for the task to be performed ▪ read the specification information provided ▪ collect all materials needed to complete the task ▪ perform the task within the given time ▪ observe and follow all health and safety (OHS) requirements at all times 	
Job Specification Information:	
<ol style="list-style-type: none"> 1. Identify, read and interpret job specifications, drawings and other workplace documents. 2. Identify and collect required tools, equipment and materials for the task. 3. Inspect worksite for hazards and implement appropriate controls (if necessary). 4. Identify and collect appropriate PPE. 5. Inspect and check tools and equipment. 6. Calculate quantity of materials required as per job specification. 7. Prepare machine as per manufacturer's specifications. 8. Program CNC milling machine. 9. Cut workpiece as per job specification. 	
<div style="background-color: #e0e0e0; padding: 5px;"> <p> Machine reference point (maximum travel of machine)</p> <p> Machine X Y zero point (could be tool change point)</p> <p> Part X Y zero point (programming start point)</p> <p> Indicates the tool change position. A G92 code will reset the axis register position coordinates to this position.</p> </div>	

For a program to run on a machine, it must contain the following codes:

M03 To start the spindle/cutter revolving.
 Sxxx The spindle speed code to set the r/min.
 Fxx The feed rate code to move the cutting tool or workpiece to the desired position.

10. Run program to produce workpiece.
11. Inspect workpiece for quality and identify any defects.
12. Close program and shutdown machine.
13. Clean, maintain and store tools and equipment.
14. Clean workplace and dispose of waste materials.

Drawing, Plan, Diagram or Sketch:



Resources Required:

Tools:	CNC milling cutters (different types)
Equipment:	N/A
Machinery:	CNC milling machine
Materials:	Aluminium flat plate
PPE:	Apron Mask Gloves Safety shoes Safety goggles

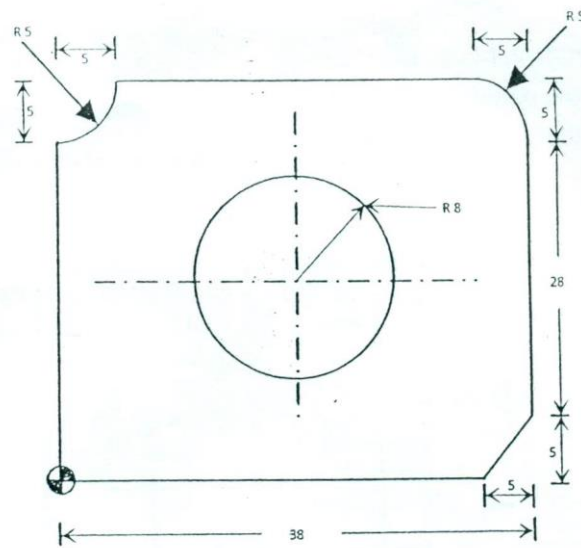
Set B: Practical Demonstration 2 – Observation Checklist

PRACTICAL DEMONSTRATION 2 – OBSERVATION CHECKLIST		
Candidate Name:		
Assessor Name:		
Qualification:	Certificate in CAD-CAM Design and Programming	
Task:	Make flat workpiece with different holes using CNC milling machine	
Assessment Centre:		
Date of Assessment:		
Instructions:	<p>The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate.</p> <p>Performance can be observed in an actual workplace or in a simulated working environment.</p> <p>If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject.</p> <p>The assessment activity (practical demonstration) should:</p> <ul style="list-style-type: none"> ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate 	
OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	No
▪ Identify and follow job specification and instructions	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and interpret symbols in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Read and interpret technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify dimensions as appropriate	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify components, assemblies, objects and materials	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify tolerance, limits and fits in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Create drawing accurately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Draw objects or parts appropriately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Clearly specify dimensions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Specify base line or datum points, as required	<input type="checkbox"/>	<input type="checkbox"/>
▪ Include instructions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check oil and coolant as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>

▪ Check air and hydraulic pressure as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set machine zero point to the required position	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set cutting tools according to required sequence of operation	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set and tight clamping devices according to standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform tool set-up as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount and centre work piece on clamping device to required level of accuracy as per workplace procedures.	<input type="checkbox"/>	<input type="checkbox"/>
▪ Download and input programme into the machine using appropriate device	<input type="checkbox"/>	<input type="checkbox"/>
▪ Simulate programme to determine the correctness of the tool path and other work parameters	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount work piece as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform CNC milling operations to produce component as per programme	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform corrective measures, if necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check and measure work piece against specification using appropriate methods and measuring tools	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mark, record and report defective work pieces for proper action	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and machines are cleaned and maintained	<input type="checkbox"/>	<input type="checkbox"/>
▪ Workplace is cleaned	<input type="checkbox"/>	<input type="checkbox"/>
▪ Waste materials are disposed in its designated/proper place	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and finished products are stored safely in an appropriate location in accordance with workplace procedures	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:		
Assessment decision for this assessment activity:		
<input type="checkbox"/> Competent <input type="checkbox"/> Not Yet Competent		
Candidate Signature:		Date:
Assessor Signature:		Date:

Set B: Practical Demonstration 3

PRACTICAL DEMONSTRATION 3	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD-CAM Design and Programming
Task:	Write program for CNC milling
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
Read and understand the directions carefully: <ul style="list-style-type: none">▪ this practical demonstration is based on the performance criteria from all or some of the units of competency in CAD-CAM Design and Programming▪ this assessment activity will be used to measure your underpinning skills▪ you will have fifteen (15) minutes to familiarise yourself with the resources to be used▪ you have two (2) hours to complete this demonstration	
Procedure:	
<ul style="list-style-type: none">▪ observe and wear personal protective equipment (PPE) as required for the task to be performed▪ read the specification information provided▪ collect all materials needed to complete the task▪ perform the task within the given time▪ observe and follow all health and safety (OHS) requirements at all times	
Job Specification Information:	
<ol style="list-style-type: none">1. Identify, read and interpret job specifications, drawings and other workplace documents.2. Identify and collect required tools, equipment and materials for the task.3. Inspect worksite for hazards and implement appropriate controls (if necessary).4. Identify and collect appropriate PPE.5. Inspect and check tools and equipment.6. Workpiece, drawing, model or concept of new design are analysed to produce CAM program.7. Cutting tools are identified and selected as per job specification.8. Sequential toolpaths are identified, generated and verified.9. CNC parameters are identified and selected according to job specification.10. Basic parameters of CNC machine are set.11. Profile, shape, and contour of workpiece is imported using CAD.12. CAM parameters are identified and set.13. Program is loaded using appropriate device.14. Run program simulation.15. Production issues are identified, recorded and reported to appropriate authority.16. Close program and shutdown machine.17. Clean, maintain and store tools and equipment.18. Clean workplace and dispose of waste materials.	

Drawing, Plan, Diagram or Sketch:

(All dimensions in mm)

Resources Required:



Tools:	N/A
Equipment:	Computer CAD Master CAM, EDGE CAM, CATIA
Machinery:	CNC machine
Materials:	Pen/pencil Paper Eraser
PPE:	Apron

Set B: Practical Demonstration 3 – Observation Checklist

PRACTICAL DEMONSTRATION 3 – OBSERVATION CHECKLIST		
Candidate Name:		
Assessor Name:		
Qualification:	Certificate in CAD-CAM Design and Programming	
Task:	Write program for CNC milling	
Assessment Centre:		
Date of Assessment:		
Instructions:	<p>The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate.</p> <p>Performance can be observed in an actual workplace or in a simulated working environment.</p> <p>If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject.</p> <p>The assessment activity (practical demonstration) should:</p> <ul style="list-style-type: none"> ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate 	
OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	No
▪ Identify and follow job specification and instructions	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and interpret symbols in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Read and interpret technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Obtain materials, instructions and standard operating procedure according to job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and flow instructions for developing cad environment	<input type="checkbox"/>	<input type="checkbox"/>
▪ Install CAD package as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set screen display areas and basic parameters as per job specification	<input type="checkbox"/>	<input type="checkbox"/>
▪ Review and modify CAD drawing, as necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and select features tools for 3D model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and select direct editing tools for 3D model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Create 3D model is created	<input type="checkbox"/>	<input type="checkbox"/>

▪ Review and modify 3D model, as necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Generate 2D drawing from 3D model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Save drawing file in designated folder as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Obtain materials, instructions and standard operating procedure according to job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Install CAM package as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and select system parameters according to job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Orient CAD model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish reference point based on job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform stock set-up	<input type="checkbox"/>	<input type="checkbox"/>
▪ Select and identify cutting tools	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify, generate and verify sequential toolpaths	<input type="checkbox"/>	<input type="checkbox"/>
▪ Generate NC programme	<input type="checkbox"/>	<input type="checkbox"/>
▪ Load programme using appropriate device	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform dry run/simulation in machine as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Record and report problems encountered to appropriate authority as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Shut-down software program and computer as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and machines are cleaned and maintained	<input type="checkbox"/>	<input type="checkbox"/>
▪ Workplace is cleaned	<input type="checkbox"/>	<input type="checkbox"/>
▪ Waste materials are disposed in its designated/proper place	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and finished products are stored safely in an appropriate location in accordance with workplace procedures	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:		
Assessment decision for this assessment activity:		
<input type="checkbox"/> Competent		<input type="checkbox"/> Not Yet Competent
Candidate Signature:		Date:
Assessor Signature:		Date:

Set C: Practical Demonstration 1

PRACTICAL DEMONSTRATION 1	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD-CAM Design and Programming
Task:	Make cylindrical workpiece using CNC lathe machine
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
<p>Read and understand the directions carefully:</p> <ul style="list-style-type: none"> ▪ this practical demonstration is based on the performance criteria from all or some of the units of competency in CAD-CAM Design and Programming ▪ this assessment activity will be used to measure your underpinning skills ▪ you will have fifteen (15) minutes to familiarise yourself with the resources to be used ▪ you have two (2) hours to complete this demonstration 	
Procedure:	
<ul style="list-style-type: none"> ▪ observe and wear personal protective equipment (PPE) as required for the task to be performed ▪ read the specification information provided ▪ collect all materials needed to complete the task ▪ perform the task within the given time ▪ observe and follow all health and safety (OHS) requirements at all times 	
Job Specification Information:	
<ol style="list-style-type: none"> 1. Identify, read and interpret job specifications, drawings and other workplace documents. 2. Identify and collect required tools, equipment and materials for the task. 3. Inspect worksite for hazards and implement appropriate controls (if necessary). 4. Identify and collect appropriate PPE. 5. Inspect and check tools and equipment. 6. Calculate quantity of materials required as per job specification. 7. Prepare machine as per manufacturer's specifications. 8. Program CNC lathe machine. 9. Cut workpiece as per job specification. 	
 Indicates the X Z 0 (zero) location which is the starting point for programming.	
 Indicates the tool-change position.	
<p>A G92 code will reset the axis register position coordinates to this position.</p>	

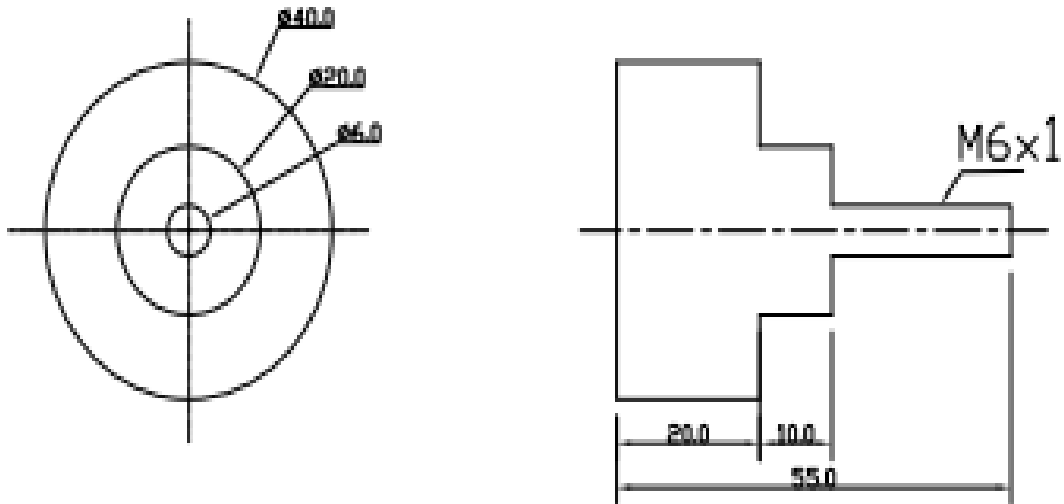
For a program to run on a machine, it must contain the following codes:

M03 To start the spindle/cutter revolving.
 Sxxx The spindle speed code to set the r/min.
 Fxx The feedrate code to move the cutting tool or workpiece to the desired position.

10. Run program to produce workpiece.
11. Inspect workpiece for quality and identify any defects.
12. Close program and shutdown machine.
13. Clean, maintain and store tools and equipment.
14. Clean workplace and dispose of waste materials.

Drawing, Plan, Diagram or Sketch:

Lathe machining drawing



(All dimensions in mm)

Resources Required:



Tools:	CNC lathe tools (different types)
Equipment:	N/A
Machinery:	CNC lathe machine
Materials:	Mild steel (AISI 1040)
PPE:	Apron Mask Gloves Safety shoes Safety goggles

Set C: Practical Demonstration 1 – Observation Checklist

PRACTICAL DEMONSTRATION 1 – OBSERVATION CHECKLIST		
Candidate Name:		
Assessor Name:		
Qualification:	Certificate in CAD-CAM Design and Programming	
Task:	Make cylindrical workpiece using CNC lathe machine	
Assessment Centre:		
Date of Assessment:		
Instructions:	<p>The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate.</p> <p>Performance can be observed in an actual workplace or in a simulated working environment.</p> <p>If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject.</p> <p>The assessment activity (practical demonstration) should:</p> <ul style="list-style-type: none"> ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate 	
OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	No
▪ Identify and follow job specification and instructions	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and interpret symbols in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Read and interpret technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify dimensions as appropriate	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify components, assemblies, objects and materials	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify tolerance, limits and fits in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Create drawing accurately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Draw objects or parts appropriately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Clearly specify dimensions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Specify base line or datum points, as required	<input type="checkbox"/>	<input type="checkbox"/>
▪ Include instructions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check oil and coolant as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>

▪ Check air and hydraulic pressure as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set machine zero point to the required position	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set cutting tools according to required sequence of operation	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set and tight clamping devices are according to standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform tool set-up as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount and centre work piece on clamping device to required level of accuracy as per workplace procedures.	<input type="checkbox"/>	<input type="checkbox"/>
▪ Download and input programme into the machine using appropriate device	<input type="checkbox"/>	<input type="checkbox"/>
▪ Simulate programme to determine the correctness of the tool path and other work parameters	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount work piece as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform CNC lathe operations to produce component as per programme	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform corrective measures, if necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check and measure work piece against specification using appropriate methods and measuring tools	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mark, record and report defective work pieces for proper action	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and machines are cleaned and maintained	<input type="checkbox"/>	<input type="checkbox"/>
▪ Workplace is cleaned	<input type="checkbox"/>	<input type="checkbox"/>
▪ Waste materials are disposed in its designated/proper place	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and finished products are stored safely in an appropriate location in accordance with workplace procedures	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:		
Assessment decision for this assessment activity:		
<input type="checkbox"/> Competent		<input type="checkbox"/> Not Yet Competent
Candidate Signature:		Date:
Assessor Signature:		Date:

Set C: Practical Demonstration 2

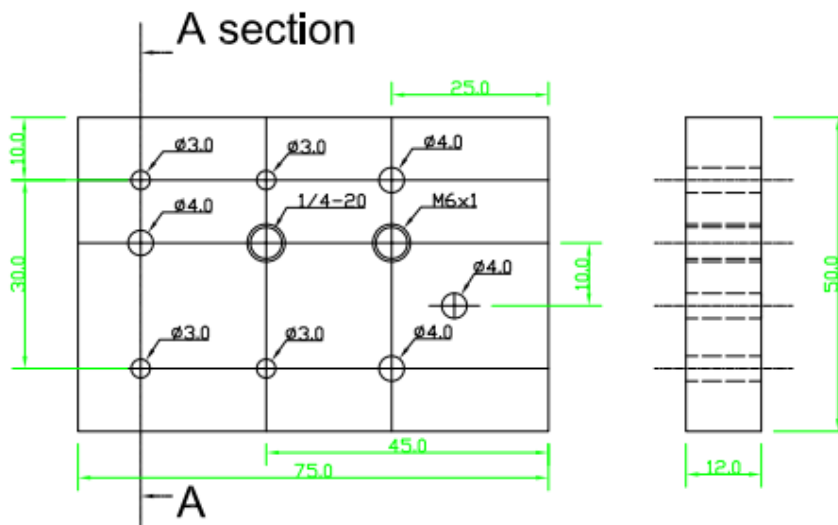
PRACTICAL DEMONSTRATION 2	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD-CAM Design and Programming
Task:	Make flat workpiece using CNC milling machine
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
<p>Read and understand the directions carefully:</p> <ul style="list-style-type: none"> ▪ this practical demonstration is based on the performance criteria from all or some of the units of competency in CAD-CAM Design and Programming ▪ this assessment activity will be used to measure your underpinning skills ▪ you will have fifteen (15) minutes to familiarise yourself with the resources to be used ▪ you have two (2) hours to complete this demonstration 	
Procedure:	
<ul style="list-style-type: none"> ▪ observe and wear personal protective equipment (PPE) as required for the task to be performed ▪ read the specification information provided ▪ collect all materials needed to complete the task ▪ perform the task within the given time ▪ observe and follow all health and safety (OHS) requirements at all times 	
Job Specification Information:	
<ol style="list-style-type: none"> 1. Identify, read and interpret job specifications, drawings and other workplace documents. 2. Identify and collect required tools, equipment and materials for the task. 3. Inspect worksite for hazards and implement appropriate controls (if necessary). 4. Identify and collect appropriate PPE. 5. Inspect and check tools and equipment. 6. Calculate quantity of materials required as per job specification. 7. Prepare machine as per manufacturer's specifications. 8. Program CNC milling machine. 9. Cut workpiece as per job specification. 	
<div style="background-color: #e0e0e0; padding: 10px;">  <p>Indicates the X Z 0 (zero) location which is the starting point for programming.</p>  <p>Indicates the tool-change position.</p> <p>A G92 code will reset the axis register position coordinates to this position.</p> </div>	

For a program to run on a machine, it must contain the following codes:

M03 To start the spindle/cutter revolving.
 Sxxx The spindle speed code to set the r/min.
 Fxx The feedrate code to move the cutting tool or workpiece to the desired position.

10. Run program to produce workpiece.
11. Inspect workpiece for quality and identify any defects.
12. Close program and shutdown machine.
13. Clean, maintain and store tools and equipment.
14. Clean workplace and dispose of waste materials.

Drawing, Plan, Diagram or Sketch:



(All dimensions in mm)

Resources Required:

Tools:	CNC milling cutters (different types)
Equipment:	N/A
Machinery:	CNC milling machine
Materials:	Aluminium flat plate
PPE:	Apron Mask Gloves Safety shoes Safety goggles

Set C: Practical Demonstration 2 – Observation Checklist

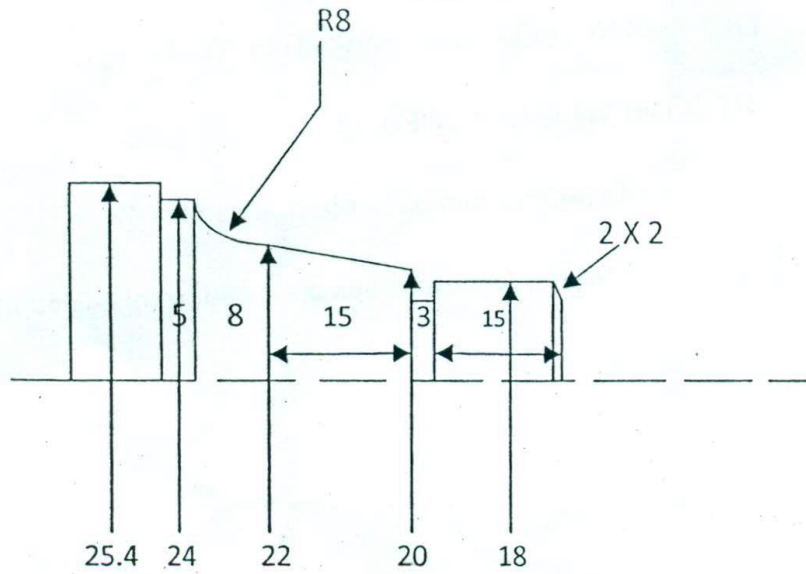
PRACTICAL DEMONSTRATION 2 – OBSERVATION CHECKLIST		
Candidate Name:		
Assessor Name:		
Qualification:	Certificate in CAD-CAM Design and Programming	
Task:	Make flat workpiece using CNC milling machine	
Assessment Centre:		
Date of Assessment:		
Instructions:	<p>The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate.</p> <p>Performance can be observed in an actual workplace or in a simulated working environment.</p> <p>If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject.</p> <p>The assessment activity (practical demonstration) should:</p> <ul style="list-style-type: none"> ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate 	
OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	No
▪ Identify and follow job specification and instructions	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and interpret symbols in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Read and interpret technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify dimensions as appropriate	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify components, assemblies, objects and materials	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify tolerance, limits and fits in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Create drawing accurately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Draw objects or parts appropriately	<input type="checkbox"/>	<input type="checkbox"/>
▪ Clearly specify dimensions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Specify base line or datum points, as required	<input type="checkbox"/>	<input type="checkbox"/>
▪ Include instructions in drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check oil and coolant as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>

▪ Check air and hydraulic pressure as per manufacturer's specification	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set machine zero point to the required position	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set cutting tools according to required sequence of operation	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set and tight clamping devices according to standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform tool set-up as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount and centre work piece on clamping device to required level of accuracy as per workplace procedures.	<input type="checkbox"/>	<input type="checkbox"/>
▪ Download and input programme into the machine using appropriate device	<input type="checkbox"/>	<input type="checkbox"/>
▪ Simulate programme to determine the correctness of the tool path and other work parameters	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mount work piece as per standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform CNC milling operations to produce component as per programme	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform corrective measures, if necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Check and measure work piece against specification using appropriate methods and measuring tools	<input type="checkbox"/>	<input type="checkbox"/>
▪ Mark, record and report defective work pieces for proper action	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and machines are cleaned and maintained	<input type="checkbox"/>	<input type="checkbox"/>
▪ Workplace is cleaned	<input type="checkbox"/>	<input type="checkbox"/>
▪ Waste materials are disposed in its designated/proper place	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and finished products are stored safely in an appropriate location in accordance with workplace procedures	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:		
Assessment decision for this assessment activity:		
<input type="checkbox"/> Competent <input type="checkbox"/> Not Yet Competent		
Candidate Signature:		Date:
Assessor Signature:		Date:

Set C: Practical Demonstration 3

PRACTICAL DEMONSTRATION 3	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD-CAM Design and Programming
Task:	Write program for CNC lathe
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
<p>Read and understand the directions carefully:</p> <ul style="list-style-type: none"> ▪ this practical demonstration is based on the performance criteria from all or some of the units of competency in CAD-CAM Design and Programming ▪ this assessment activity will be used to measure your underpinning skills ▪ you will have fifteen (15) minutes to familiarise yourself with the resources to be used ▪ you have two (2) hours to complete this demonstration 	
Procedure:	
<ul style="list-style-type: none"> ▪ observe and wear personal protective equipment (PPE) as required for the task to be performed ▪ read the specification information provided ▪ collect all materials needed to complete the task ▪ perform the task within the given time ▪ observe and follow all health and safety (OHS) requirements at all times 	
Job Specification Information:	
<ol style="list-style-type: none"> 1. Identify, read and interpret job specifications, drawings and other workplace documents. 2. Identify and collect required tools, equipment and materials for the task. 3. Inspect worksite for hazards and implement appropriate controls (if necessary). 4. Identify and collect appropriate PPE. 5. Inspect and check tools and equipment. 6. Workpiece, drawing, model or concept of new design are analysed to produce CAM program. 7. Cutting tools are identified and selected as per job specification. 8. Sequential toolpaths are identified, generated and verified. 9. CNC parameters are identified and selected according to job specification. 10. Basic parameters of CNC machine are set. 11. Profile, shape, and contour of workpiece is imported using CAD. 12. CAM parameters are identified and set. 13. Program is loaded using appropriate device. 14. Run program simulation. 15. Production issues are identified, recorded and reported to appropriate authority. 16. Close program and shutdown machine. 17. Clean, maintain and store tools and equipment. 18. Clean workplace and dispose of waste materials. 	

Drawing, Plan, Diagram or Sketch:



(All dimensions in mm)

Resources Required:

Tools:	N/A
Equipment:	Computer CAD Master CAM, EDGE CAM, CATIA
Machinery:	CNC machine
Materials:	Pen/pencil Paper Eraser
PPE:	Apron

Set C: Practical Demonstration 3 – Observation Checklist

PRACTICAL DEMONSTRATION 3 – OBSERVATION CHECKLIST		
Candidate Name:		
Assessor Name:		
Qualification:	Certificate in CAD-CAM Design and Programming	
Task:	Write program for CNC lathe	
Assessment Centre:		
Date of Assessment:		
Instructions:	<p>The tasks listed on the observation checklist of the practical demonstration will provide performance evidence of the candidate.</p> <p>Performance can be observed in an actual workplace or in a simulated working environment.</p> <p>If performance of particular tasks cannot be observed, you may ask the candidate to explain a procedure or enter into a discussion on the subject.</p> <p>The assessment activity (practical demonstration) should:</p> <ul style="list-style-type: none"> ▪ fit industry requirements in which the assessment will be conducted ▪ adhere, where possible, to reasonable adjustment practices ▪ ensure that suitable performance benchmarks are applied and explained to the candidate 	
OBSERVATION RECORD		
Performance Criteria	Place a ✓ to show if evidence has been demonstrated competently	
	Yes	No
▪ Identify and follow job specification and instructions	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and interpret symbols in technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Read and interpret technical drawing	<input type="checkbox"/>	<input type="checkbox"/>
▪ Obtain materials, instructions and standard operating procedure according to job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and flow instructions for developing cad environment	<input type="checkbox"/>	<input type="checkbox"/>
▪ Install CAD package as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Set screen display areas and basic parameters as per job specification	<input type="checkbox"/>	<input type="checkbox"/>
▪ Review and modify CAD drawing, as necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and select features tools for 3D model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and select direct editing tools for 3D model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Create 3D model is created	<input type="checkbox"/>	<input type="checkbox"/>

▪ Review and modify 3D model, as necessary	<input type="checkbox"/>	<input type="checkbox"/>
▪ Generate 2D drawing from 3D model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Save drawing file in designated folder as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Obtain materials, instructions and standard operating procedure according to job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Install CAM package as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify and select system parameters according to job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Orient CAD model	<input type="checkbox"/>	<input type="checkbox"/>
▪ Establish reference point based on job requirement	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform stock set-up	<input type="checkbox"/>	<input type="checkbox"/>
▪ Select and identify cutting tools	<input type="checkbox"/>	<input type="checkbox"/>
▪ Identify, generate and verify sequential toolpaths	<input type="checkbox"/>	<input type="checkbox"/>
▪ Generate NC programme	<input type="checkbox"/>	<input type="checkbox"/>
▪ Load programme using appropriate device	<input type="checkbox"/>	<input type="checkbox"/>
▪ Perform dry run/simulation in machine as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Record and report problems encountered to appropriate authority as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Shut-down software program and computer as per standard operating procedure	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and machines are cleaned and maintained	<input type="checkbox"/>	<input type="checkbox"/>
▪ Workplace is cleaned	<input type="checkbox"/>	<input type="checkbox"/>
▪ Waste materials are disposed in its designated/proper place	<input type="checkbox"/>	<input type="checkbox"/>
▪ Tools, equipment and finished products are stored safely in an appropriate location in accordance with workplace procedures	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:		
Assessment decision for this assessment activity:		
<input type="checkbox"/> Competent		<input type="checkbox"/> Not Yet Competent
Candidate Signature:		Date:
Assessor Signature:		Date:

Oral Questions (Optional)

ORAL QUESTIONS - INSTRUCTIONS	
Candidate Name:	
Assessor Name:	
Qualification:	Certificate in CAD/CAM Design and Programming
Unit of Competency	
Generic Competencies	
SEIP-LE-CAD-01-G	Use basic mathematical concepts
SEIP-LE-CAD-02-G	Carry out workplace interaction
SEIP-LE-CAD-03-G	Operate in a team environment
SEIP-LE-CAD-04-G	Apply basic IT skills
Sector-specific Competencies	
SEIP-LE-CAD-01-S	Apply occupational health and safety (OHS) practice in the workplace
SEIP-LE-CAD-02-S	Read and interpret sketches and drawings
SEIP-LE-CAD-03-S	Use hand and power tools
SEIP-LE-CAD-04-S	Apply quality system
Occupation-specific Competencies	
SEIP-LE-CAD-01-O	Create mechanical drawing
SEIP-LE-CAD-02-O	Carry out CNC lathe machine operations
SEIP-LE-CAD-03-O	Carry out CNC milling machine operations
SEIP-LE-CAD-04-O	Develop 3D model using CAD software
SEIP-LE-CAD-05-O	Perform CAM programming
Assessment Centre:	
Date of Assessment:	
Time of Assessment:	
Instructions:	
<p>Read and understand the directions carefully:</p> <ul style="list-style-type: none"> ▪ these oral questions are based on the performance criteria from all the units of competency in CAD/CAM Design and Programming ▪ oral questions are designed to enable additional assessment of your underpinning knowledge ▪ you should present your responses as directed by the assessor ▪ answer all the questions asked by the assessor as best as possible 	

ORAL QUESTIONS			
Question		Place a ✓ in the appropriate box to show if evidence has been demonstrated competently	
		Yes	No
1.	What is a CNC machine?	<input type="checkbox"/>	<input type="checkbox"/>
2.	What is a CNC controller?	<input type="checkbox"/>	<input type="checkbox"/>
3.	What is G Code?	<input type="checkbox"/>	<input type="checkbox"/>
4.	What does a CNC Machine Operator do?	<input type="checkbox"/>	<input type="checkbox"/>
5.	What is APT language?	<input type="checkbox"/>	<input type="checkbox"/>
6.	What is 'part program'?	<input type="checkbox"/>	<input type="checkbox"/>
7.	What is the Machine Control Unit?	<input type="checkbox"/>	<input type="checkbox"/>
8.	What are the activities of CAM?	<input type="checkbox"/>	<input type="checkbox"/>
9.	What is CNC Milling?	<input type="checkbox"/>	<input type="checkbox"/>
10.	What is Fanuc in CNC?	<input type="checkbox"/>	<input type="checkbox"/>
11.	Give an example of a people-oriented team role.	<input type="checkbox"/>	<input type="checkbox"/>
12.	Developing a project plan is a task of who?	<input type="checkbox"/>	<input type="checkbox"/>
13.	Name the tool that clearly shows the reporting relationships within an organisation.	<input type="checkbox"/>	<input type="checkbox"/>
14.	Why should a conflict be dealt with immediately?	<input type="checkbox"/>	<input type="checkbox"/>
15.	What is a file?	<input type="checkbox"/>	<input type="checkbox"/>
16.	Explain the use of the subject line in emails.	<input type="checkbox"/>	<input type="checkbox"/>
17.	What skills are required for conducting workplace interactions in a courteous manner?	<input type="checkbox"/>	<input type="checkbox"/>
18.	What does COC stands for?	<input type="checkbox"/>	<input type="checkbox"/>
19.	What is a user guide?	<input type="checkbox"/>	<input type="checkbox"/>
20.	What is the definition of workplace documents?	<input type="checkbox"/>	<input type="checkbox"/>
21.	What does the first line supervisor control in a self-directed team?	<input type="checkbox"/>	<input type="checkbox"/>
22.	What are some examples of modes of communication?	<input type="checkbox"/>	<input type="checkbox"/>
23.	How many ways you can present yourself?	<input type="checkbox"/>	<input type="checkbox"/>
24.	How many phases are there for interview preparedness?	<input type="checkbox"/>	<input type="checkbox"/>
25.	What will be your answer if you are asked if you have any questions of your own?	<input type="checkbox"/>	<input type="checkbox"/>

26.	Name four IT tools.	<input type="checkbox"/>	<input type="checkbox"/>
27.	What is a common application program's file extension?	<input type="checkbox"/>	<input type="checkbox"/>
28.	How do name a cell on spreadsheet?	<input type="checkbox"/>	<input type="checkbox"/>
29.	Name two browsers on the internet.	<input type="checkbox"/>	<input type="checkbox"/>
30.	What are the four phases of emergency management?	<input type="checkbox"/>	<input type="checkbox"/>
31.	Say whether true or false: A work ethic is a set of moral principles a person uses in their job.	<input type="checkbox"/>	<input type="checkbox"/>
Feedback to candidate:			
Assessment decision for this assessment activity:			
<input type="checkbox"/> Competent		<input type="checkbox"/> Not Yet Competent	
Candidate Signature:		Date:	
Assessor Signature:		Date:	

Oral Questioning Guideline

General Guidelines For Effective Questioning	
▪	Keep questions short and focused on one key concept
▪	Ensure that questions are structured
▪	Test the questions to check that they are not ambiguous
▪	Use `open-ended questions such as `what if...?' and `why...?' questions, rather than closed questions
▪	Keep questions clear and straight forward and ask one at a time
▪	Use words that the candidate is able to understand
▪	Look at the candidate when asking questions
▪	Check to ensure that the candidate fully understands the questions
▪	Ask the candidate to clarify or re-phrase their answer if the assessor does not understand the initial response
▪	Confirm the candidate's response by repeating the answer back in his/her own words
▪	Encourage a conversational approach with the candidate when appropriate, to put him or her at ease
▪	Use questions or statements as prompts for keeping focused on the purpose of the questions and the kind of evidence being collected
▪	Use language at a suitable level for the candidate
▪	Listen carefully to the answers for opportunities to find unexpected evidence
▪	Follow up responses with further questions, if useful, to draw out more evidence or to make links between knowledge areas
▪	Compile a list of acceptable responses to ensure reliability of assessments

Oral Questions (Optional) - Answers

Answers are highlighted in **bold** and *italics*.

ORAL QUESTIONS	
Question	Answer
1. What is a CNC machine?	<i>CNC Machining is a process used in the manufacturing sector that involves the use of computers to control machine tools. Tools that can be controlled in this manner include lathes, mills, routers and grinders. The CNC in CNC machining stands for Computer Numerical Control.</i>
2. What is a CNC controller?	<i>The CNC controller is the brain of a CNC system. A controller completes the all-important link between a computer system and the mechanical components of a CNC machine.</i>
3. What is G Code?	<i>G Code is the generic name for a control language for CNC machines. It is a way for you to tell the machine to move to various points at a desired speed, control the spindle speed, turn on and off various coolants, and all sorts of other things.</i>
4. What does a CNC Machine Operator do?	<i>CNC machine operators set up and work with computer numerically controlled (CNC) machines, a type of equipment that is usually found in the metalworking industry. Their jobs often involve repetitive tasks and the monitoring of multiple machines.</i>
5. What is APT language?	<i>APT (automated programming language) is a computer program, it automatically calculates the tool path, generates program and controls the machine by receiving general high-level languages.</i>
6. What is 'part program'?	<i>Part program is a high-level language containing the instructions for machining a part to various standard words, codes and symbols.</i>
7. What is the Machine Control Unit?	<i>The machine control unit (MCU) is the heart of a CNC system. It is used to perform the following functions: To read the coded instructions. To decode the coded instructions. To implement interpolations (linear, circular, and helical) to generate axis motion commands.</i>
8. What are the activities of CAM?	<i>A CAM activity includes process planning, NC part programming, production scheduling, and computer production monitoring and computer</i>

		process control.
9.	What is CNC Milling?	CNC milling is a specific form of computer numerical controlled (CNC) machining. Milling itself is a machining process similar to both drilling and cutting, and able to achieve many of the operations performed by cutting and drilling machines. Like drilling, milling uses a rotating cylindrical cutting tool.
10.	What is Fanuc in CNC?	The world standard CNC from FANUC powers. FANUC i Series CNC. A wide range of CNCs for simple machine tools to the most complex, as well as for other general industrial machines. FANUC has produced over 3.6 million CNC's and those CNC's are used to power machines around the globe.
11.	Give an example of a people-oriented team role.	Coordinator
12.	Developing a project plan is a task of who?	Project Manager
13.	Name the tool that clearly shows the reporting relationships within an organisation.	Organizational chart
14.	Why should a conflict be dealt with immediately?	To avoid it escalating.
15.	What is a file?	A file is the common storage unit in a computer. All programs and data are contained in a file, and the computer reads and writes files.
16.	Explain the use of the subject line in emails.	<ul style="list-style-type: none"> ▪ The subject line provides an opportunity to inform the receiver of the purpose of the email. ▪ A subject line ideally should describe exactly what the email is about. ▪ An appropriate subject line will maximize the possibility of a message being read.
17.	What skills are required for conducting workplace interactions in a courteous manner?	<ul style="list-style-type: none"> ▪ Effective questioning ▪ Active listening ▪ Speaking skills ▪ Email writing skills
18.	What does COC stands for?	Code of conduct
19.	What is a user guide?	It is a technical communication document intended to give assistance to people using a particular system.
20.	What is the definition of workplace documents?	Workplace documents are a set of materials that inform employees of workplace policies, processes and procedures.
21.	What does the first line supervisor control in a self-	<ul style="list-style-type: none"> ▪ Critical management process of:

	directed team?	<ul style="list-style-type: none"> ○ Planning ○ Organising ○ Directing ○ Staffing
22.	What are some examples of modes of communication?	<ul style="list-style-type: none"> ▪ Team meetings ▪ Email updates
23.	How many ways you can present yourself?	<ul style="list-style-type: none"> ▪ Curriculum Vitae ▪ Infographic ▪ Profile/portfolio
24.	How many phases are there for interview preparedness?	<ul style="list-style-type: none"> ▪ Phase One – before the interview ▪ Phase Two – the start ▪ Phase Three – the interview ▪ Phase Four – closing of interview
25.	What will be your answer if you are asked if you have any questions of your own?	Ask whether the offer will be confirmed in writing.
26.	Name four IT tools.	<ul style="list-style-type: none"> ▪ Computer ▪ Television ▪ Mobile phone ▪ Radio ▪ Internet
27.	What is a common application program's file extension?	A file extension, also called a filename extension, is the suffix at the end of a filename, which indicates what kind of file it is. For example, you can tell that the file "computer.docx" is an MS Word document file.
28.	How do name a cell on spreadsheet?	With its column and row position on the sheet (i.e. B9).
29.	Name two browsers on the internet.	<ul style="list-style-type: none"> ▪ Internet Explorer ▪ Google Chrome ▪ Firefox
30.	What are the four phases of emergency management?	<ul style="list-style-type: none"> ▪ Mitigation ▪ Preparedness ▪ Response ▪ Recovery
31.	Say whether true or false: A work ethic is a set of moral principles a person uses in their job.	True

Assessment Evidence Summary Sheet

EVIDENCE SUMMARY SHEET			
Candidate Name:			
Assessor Name:			
Qualification:	Certificate in CAD/CAM Design and Programming		
Assessment Centre:			
Date(s) of Assessment:			
The performance of the candidate in the following unit or units of competency and the methods engaged to assess performance are as follows:			
Unit of Competency	Assessment Method	Competent	Not Yet Competent
All units of competency comprising of the qualification	Written Test	<input type="checkbox"/>	<input type="checkbox"/>
	Practical Demonstration 1 (Set)	<input type="checkbox"/>	<input type="checkbox"/>
	Practical Demonstration 2 (Set)	<input type="checkbox"/>	<input type="checkbox"/>
	Practical Demonstration 3 (Set)	<input type="checkbox"/>	<input type="checkbox"/>
	Oral Questioning (optional)	<input type="checkbox"/>	<input type="checkbox"/>
Note: Issuance of a certificate will only be given to a candidate who has successfully been assessed as competent for ALL units of competency.			
Recommendation			
<input type="checkbox"/> Issuance of Statement of Achievement (<i>indicate title of SOA, if full Certificate is not met</i>)	<input type="checkbox"/> Submission of additional documents Specify:	<input type="checkbox"/> Reassessment Specify:	
Did the candidate overall performance meet the required evidence/standard?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Overall Evaluation:	<input type="checkbox"/> Competent <input type="checkbox"/> Not Yet Competent		
General Comments:			
Candidate Signature:		Date:	
Assessor Signature:		Date:	
Institution Manager Signature:		Date:	

CANDIDATES COPY
(Please presents this form when you claim your Certificate)

ASSESSMENT RESULTS SUMMARY			
Qualification:	Certificate in CAD/CAM Design and Programming		
Name of Candidate:		Date:	
Name at Assessment Centre:		Date:	
Assessment Results:	<input type="checkbox"/> Competent <input type="checkbox"/> Not Yet Competent		
Recommendation:	<input type="checkbox"/> Issuance of SOA (<i>indicate title of SOA, if full certificate is not met</i>)		
	<input type="checkbox"/> Submission of additional documents – specify:		
	<input type="checkbox"/> Reassessment - specify:		
Assessed by: (name and signature)		Date:	
Attested by: (name and signature):		Date	

Assessment Validation Map

This identifies how the assessment tools in this resource may assess:

- elements and performance criteria
- critical aspects of assessment
- skills and knowledge
- employability skills

Unit of Competency:	SEIP-LE-CAD-01-G – Use basic mathematical concepts		
Element	Assessment Method		
	Written	Practical	Oral
1. Identify calculation requirements in the workplace.	4	A1-3 B1-3 C1-3	2
2. Select appropriate mathematical methods/concepts for the calculation.	4	A1-3 B1-3 C1-3	2
3. Use tools and instruments to perform calculations.	4	A1-3 B1-3 C1-3	
Unit of Competency:	SEIP-LE-CAD-02-G – Carry out workplace interaction		
Element	Assessment Method		
	Written	Practical	Oral
1. Interpret workplace communication and etiquette.	11	A1-3 B1-3 C1-3	13, 17
2. Read and understand workplace documents.		A1-3 B1-3 C1-3	18, 19, 20
3. Participate in workplace meetings and discussions.	12		24
4. Practice professional ethics at work.	12	A1-3 B1-3 C1-3	23, 31
Unit of Competency:	SEIP-LE-CAD-03-G – Operate in a team environment		
Element	Assessment Method		

		Written	Practical	Oral
1. Identify team goals and work processes.			A1-3 B1-3 C1-3	12, 21
2. Identify own role and responsibilities within team.				4, 13
3. Communicate and co-operate with team members.		11	A1-3 B1-3 C1-3	11, 22, 25
4. Practice problem solving within team.			A1-3 B1-3 C1-3	14
Unit of Competency:	SEIP-LE-CAD-04-G – Apply basic IT skills			
Element	Assessment Method			
	Written	Practical	Oral	
1. Identify and use most commonly used IT tools.		A3, B3, C3	26, 28	
2. Understand use of computer.		A3, B3, C3	15	
3. Work with word processing application.			27	
4. Access email and search the internet.			16, 29	
Unit of Competency:	SEIP-LE-CAD-01-S – Apply occupational health and safety (OHS) practice in the workplace			
Element	Assessment Method			
	Written	Practical	Oral	
1. Identify OHS Policies and procedures.		A1-3 B1-3 C1-3		
2. Apply personal health and safety practices.	13	A1-3 B1-3 C1-3		
3. Report hazards and risks.		A1-3 B1-3 C1-3		

4. Respond to emergencies.				30
Unit of Competency:	SEIP-LE-CAD-02-S – Read and interpret sketches and drawings			
Element	Assessment Method			
	Written	Practical	Oral	
1. Interpret information and specifications.		A1-3 B1-3 C1-3	20	
2. Read and interpret sketches and drawings.		A1-3 B1-3 C1-3		
Unit of Competency:	SEIP-LE-CAD-03-S – Use hand and power tools			
Element	Assessment Method			
	Written	Practical	Oral	
1. Identify and inspect hand and power tools.		A1, A2, B1, B2, C1, C2		
2. Use hand tools properly and safely.		A1, A2, B1, B2, C1, C2		
3. Operate power tools properly and safely.		A1, A2, B1, B2, C1, C2		
4. Clean and maintain hand and power tools.		A1, A2, B1, B2, C1, C2		
Unit of Competency:	SEIP-LE-CAD-04-S– Apply quality system			
Element	Assessment Method			
	Written	Practical	Oral	
1. Work within a quality system.		A1-3 B1-3 C1-3		
2. Apply and monitor a quality system.		A1-3 B1-3 C1-3		
3. Apply standard procedures for each job.		A1-3		

		B1-3 C1-3	
Unit of Competency:	SEIP-LE-CAD-01-O – Create mechanical drawing		
Element	Assessment Method		
	Written	Practical	Oral
1. Identify drawing.		A1, A2, B1, B2, C1, C2	
2. Create drawing.	1, 2, 3	A1, A2, B1, B2, C1, C2	
Unit of Competency:	SEIP-LE-CAD-02-O – Carry out CNC lathe machine operations		
Element	Assessment Method		
	Written	Practical	Oral
1. Set-up CNC lathe machine.	6, 9, 10	A1, B1, C1	1, 2, 3
2. Download and input programme.	8, 20	A1, B1, C1	7
3. Perform CNC lathe machine operations.	18	A1, B1, C1	
4. Check and measure workpiece.		A1, B1, C1	
Unit of Competency:	SEIP-LE-CAD-03-O – Carry out CNC milling machine operations		
Element	Assessment Method		
	Written	Practical	Oral
1. Set-up CNC milling machine.	5, 6, 9, 10, 19	A2, B2, C2	5, 9
2. Download and input programme.	8, 20	A2, B2, C2	7
3. Perform CNC milling machine operations.	18	A2, B2, C2	
4. Check and measure workpiece.		A2, B2, C2	
Unit of Competency:	SEIP-LE-CAD-04-O – Develop 3D model using CAD software		
Element	Assessment Method		

		Written	Practical	Oral
1. Prepare CAD environment.		14, 15	A3, B3, C3	
2. Produce 2D drawing.		7	A3, B3, C3	
3. Create 3D model.			A3, B3, C3	
4. Save and print drawing.			A3, B3, C3	
Unit of Competency:	SEIP-LE-CAD-05-O – Perform CAM programming			
Element	Assessment Method			
	Written	Practical	Oral	
1. Prepare CAM environment.	16	A3, B3, C3	8	
2. Carry out CAM programming.		A3, B3, C3		
3. Load and run programme.	17	A3, B3, C3	10	