

071605T4MCT

MECHATRONICS TECHNOLOGY LEVEL 5

ENG/OS/MC/CR/04/5

Operate Robotic and Automated Systems

July/August 2025



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION
COUNCIL (TVET CDACC)**

PRACTICE ASSESSMENT

INSTRUCTIONS TO ASSESSOR

1. Assess the candidate as the practical progresses, observing the critical areas.
2. You are required to mark the practical as the candidate performs the tasks.
3. You are required to take video clips at critical points.
4. Ensure the candidate has a name tag and registration code at the back and front.

OBSERVATION CHECKLIST

Candidate's Name			
Registration Code			
Assessors Name;			
Registration Code			
Venue of Assessment			
Date of Assessment			
Items to be evaluated: <i>Please award marks as appropriate. Give a brief comment on your observation.</i>	Marks Available	Marks Obtained	Comments
1. Observed safety and health standards. <i>i. Dust coat</i> <i>ii. Safety shoes</i> <i>(Award 2 marks if worn and 0 if not)</i>	2		
Sub-Total 1	2		
Task 1: Set up and configured the installation area			
2. Inspected pneumatic robot arm and ide each of the following components: <i>i. End effector</i> <i>ii. Manipulator</i> <i>iii. Joints and actuators</i> <i>iv. Controller</i> <i>v. Sensors</i> <i>(Award 2 marks for each correct response)</i>	10		
3. Connected pneumatic and power supply as per the system specifications. <i>(Award 2 marks for correct pneumatic connection and 3 marks for correct power supply connection)</i>	5		
4. Located the following on the robot system; <i>i. The emergency stop button</i> <i>ii. Start button,</i> <i>iii. Stop button,</i> <i>iv. Mode selection button</i> <i>(Award 1 mark for each correct identification)</i>	4		
Sub-Total 2	19		
Task 2: Developed a tag table for input/output setup			
5. Created and configured basic tag table for input/output setup.	5		

<i>(Award 5 marks for the correct table)</i>			
Sub-Total 3	5		
Task 3: Programed the pick-and-place cycle to move for three cycles and then stop			
6. Developed a working pick-and-place program. <i>(Award 5 marks or zero)</i>	5		
7. Uploaded and executed the control program using software. <i>(Award 3 marks or 0)</i>	3		
Sub-Total 4	8		
Task 4: Debugged and tested the installation			
8. Verified robot returned to home position after each cycle. <i>(Award 3 marks or 0)</i>	3		
9. Observed and noted any inconsistencies or errors in the robot's motion. <i>(Award 3 marks or 0)</i>	3		
10. Edited and debugged the program for full functionality. <i>(Award 3 marks or 0)</i>	3		
Sub-Total 5	9		
Task 5: Operated the robot arm			
11. Tested emergency stop functionality during operation. <i>(Award 2 marks or 0)</i>	2		
12. Successfully demonstrated 3 cycles of the pick-and-place task. <i>(Award 10 marks or 0)</i>	10		
13. Procedurally shut down the system i. Shut the air supply. <i>(Award 2 marks or 0)</i> ii. Shut off power to the robot <i>(Award 1 mark or 0)</i> iii. Closed the robot programming software <i>(Award 1 mark or 0)</i> iv. Shut the host PC <i>(Award 1 mark or 0)</i>	5		
Sub-Total 6	17		
Grand Total	60		

ASSESSMENT OUTCOME	
The candidate was found to be: Competent <input style="width: 50px; height: 30px; border: 1px solid black;" type="checkbox"/> Not yet Competent <input style="width: 50px; height: 30px; border: 1px solid black;" type="checkbox"/> <i>(Please tick as appropriate)</i> <i>(The candidate is competent if the candidate obtains at least 50%)</i>	
Feedback from the Candidate:	
Feedback to the Candidate:	
Candidate Signature _____	Date: _____
Assessor's Signature _____	Date _____

Expectations:

To assess the student's ability to configure, program, and operate a PLC-controlled pick-and-place robot arm that executes exactly three full pick-and-place cycles before stopping.

Upon pressing the START push button, the PLC-controlled pick-and-place robot arm initiated a sequence where it moved to the pick location, activated the gripper to pick the object, then moved to the designated place position to release it, and returned to the home position. This cycle repeated precisely three times, with the PLC using a counter to track the completed operations. After the third cycle, the PLC logic stopped all further motion commands, leaving the robot in the home position until a manual reset or new start command is given.