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INDUSTRIAL AUTOMATION AND ROBOTICS LEVEL 6

ENG/OS/IA/CR/06/6

Install and Maintain Robotic Systems

July/August 2025

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

PRACTICAL ASSESSMENT

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Time: 3 HOURS

INSTRUCTIONS TO CANDIDATE:

1. You are given a program intended to move each valve body from to the Feed Stand and place each valve body in the Assembly Feeder. You are required to perform the following tasks:
   - **i. Task 1:** Install components.
     - Install the following components at the Robotic Assembly Station:
       - Feed Stand
       - Parts Bin
       - Assembly Feeder.

     N/B: You are required to select appropriate positions at your Robotic Assembly station to install the components.
   - **ii. Task 2:** Troubleshoot and run the program.
     - You are required to debug the given robotic program so that the robot arm correctly performs the following sequence:
       a. Move from home position to the Feed Stand

b. Pick each valve body from the Feed Stand
c. Place the valve body into the assembly feeder
d. Repeat the pick-and-place cycle until the Assembly Feeder is full
e. Return the robot to the home position

N/B: Manually place each valve body on the Feed Stand before starting the sequence

iii. **Task 3:** Write a maintenance report.

- Prepare a brief maintenance report that includes:
  - The errors identified in the program/system
  - The corrective actions taken to resolve the issues
  - Recommendations for preventing similar errors in the future

iv. **Task 4:** Program the Robot Arm Using Offline Simulation

- Using offline simulation, develop a robot program that performs the following operations:
  a. Move the robot from home location to the safe location
  b. Pick a valve body from the safe location
  c. Place the valve body into the parts bin
  d. Repeat this sequence until the Assembly Feeder is empty
  e. Return the robot to the home position.

N/B:

- Manually adjust the escapement and adjustment screw on the Assembly Feeder to release each valve body
- Then, manually move each valve body to a safe location before the robot arm picks the valve body
- Safe location is a predefined point within the Robotic Assembly Station where the Robot arm does not collide with the Assembly Feeder.

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2. You have been provided with the following resources for the practical tasks
    - Robotic Assembly station
    - Feed Stand/single feed stand
    - 1/4-20 x 3/8-inch button head cap screws
    - Triple T-nut/double t-nut
    - Single T-nuts
    - Mounting bracket
    - Screwdriver
    - 7/16-inch hex wrench
    - Parts bin
    - 1/4-20 x 1/2” thumbscrews
    - Teach pendant
    - Acrylic valve body
    - knob/spring Assembly Feeder
    - Hex wrench

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