

071606T4MCT

MECHATRONIC TECHNICIAN LEVEL 6

ENG/OS/MC/CR/03/6/A

Maintain Electro-Mechanical Systems

July/Aug 2023



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

**WRITTEN
TEST**

INSTRUCTIONS TO CANDIDATES

1. Marks for each question are indicated in the brackets.
2. The paper consists of TWO sections **A** and **B**.
3. Answer ALL Questions in section **A** and any THREE in section **B**.
4. You are provided with a separate answer booklet.

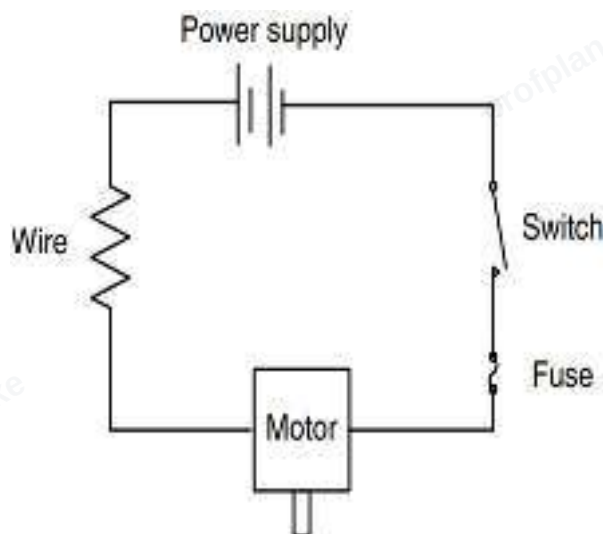
This paper consists of FOUR printed pages.

Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A: (40 MARKS)

*Attempt **all** the questions in this section.*

1. OSHA requires employees to wear appropriate PPE in the workshops. Identify FOUR types of PPE and give the usage of each. (4 marks)
2. During tools and equipment storage, list FIVE key practices you should observe when storing and maintaining engineering tools and equipment. (5 marks)
3. Outline the function of the following tools. (5 marks)
 - a. Half-round file
 - b. Wire strippers
 - c. Pipe wrench
 - d. Infrared camera
 - e. Electric hand drill
4. As a technician, state THREE physical fault indicators that you should always be alert to notice when working with electromechanical systems. (3 marks)
5. Define the term reliability-centered maintenance (RCM) as used in electro-mechanical systems maintenance. (2 marks)
6. Differentiate between direct and indirect maintenance in electro-mechanical systems. (4 marks)
7. In the circuit shown below, mention FIVE issues that might make the motor electric system fail to function. (5 marks)



8. Lubricants are used in high-speed machines or engine parts due to their high viscosity and fluidity. Identify FOUR types of lubricants that are used in mechanical components. (4 marks)

9. Identify and explain any FOUR types of wear mechanisms in plant equipment.(4 marks)

10. A repair report is a document that contains specific information about past maintenance.

Identify FOUR essential information found in a repair report. (4 marks)

SECTION B: (60 MARKS)

*Attempt any **three** questions in this section.*

11.

- a. There are various types of mechanical drives used electro-mechanical system, state and explain THREE types of mechanical drives. (12 Marks)
- b. The task of a troubleshooter is to fix the underlying problems in electromechanical systems so as to minimize downtime during operation. Explain FOUR troubleshooting techniques. (8 marks)

12.

- a. Equipment inspection is the best way to ensure that it will perform its function as expected. Discuss FOUR inspection methods in electrical systems. (12 marks)
- b. Inspection is an organized examination or formal evaluation exercise. Discuss FOUR inspection methods of mechanical systems. (8 marks)

13.

- a. Every electromechanical component reduces due to wear and tear. Discuss FIVE types of maintenance. (10 marks)
- b. The importance of an effective maintenance program cannot be overlooked because it plays an important role in the effectiveness of lean manufacturing. Explain FIVE reasons for performing maintenance of electro-mechanical systems. (10 marks)

14.

- a. Workplace health and safety is both the moral and legal responsibility of a technician or employee. Explain FIVE common workshop health and safety hazards when working on electromechanical systems. (10 marks)
- b. Discuss FIVE methods of mechanical assembly. (10 marks)