



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

Qualification Code : 071606T4MCT
Qualification : Mechatronic Technician Level 6
Unit Code : ENG/OS/MC/CR/02/6/A
Unit of Competency : Install Mechatronic Systems

WRITTEN ASSESMENT

INSTRUCTIONS TO CANDIDATE:

1. You have **TWO HOURS** to attempt all the questions.
2. Marks for each section are indicated in the brackets
3. The paper consists of **TWO** sections: **A** and **B**.
4. Attempt **ALL** questions from section **A** and **ANY THREE** questions from section **B**.
5. You are required to provide your responses on the answer booklet provided.

*This paper consists of **THREE (3)** 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: SHORT ANSWER QUESTIONS (40 MARKS)

(Attempt ALL the questions from this section. Marks are indicated on each question)

1. List four sources of possible errors in sensing instruments. (4 Marks)
2. Define the following terms (3 Marks)
 - i. Sensor
 - ii. Actuator
 - iii. Transducer
3. Outline three advantages of a conduit wiring system. (3 Marks)
4. Explain the difference between active and passive sensors. Give two examples of each type of sensor. (4 Marks)
5. Explain the function of each of the following pipe fittings: (3 Marks)
 - i. elbow;
 - ii. tee;
 - iii. socket.
6. List the four factors that must be considered when selecting a wire insulation. (4 Marks)
7. State four properties of a GI pipe. (4 Marks)
8. Explain the following stepper motor terminology (2 Marks)
 - i. Pull-out torque
 - ii. Pull-in torque
 - iii. Dynamic torque
9. List the three types of conductors that are recognized by the National Electrical Code (NEC). (3 Marks)
10. List the three major sections of an electronic variable frequency drive, and state the main function performed by each. (6 Marks)

SECTION B: EXTENDED ANSWER QUESTIONS (60 MARKS)

(Attempt ANY THREE questions from this section. Each question carries 20 marks)

11.

- i. Discuss the advantages and disadvantages of pneumatic actuation system. (10 marks)
- ii. In the past, unsatisfactory test probes and voltage indicators have frequently been the cause of accidents. The Health and Safety Executive (HSE) has published a guidance note (GS 38) which advise electricians and other electrically competent people on the selection of suitable test probes. Discuss five features that all test probes must incorporate according to GS 38. (10 marks)

12.

- i. Describe the advantages and disadvantages of DC motor. (10 marks)
- ii. Describe the five steps involved in successfully finding an electrical fault. (10 marks)

13. Different factors must be kept in mind when you are selecting any wiring system Discuss ten factors to consider. (20 marks)

14.

- i. Discuss five important static characteristics of sensors. (10 marks)
- ii. Illustrate five comparison of pneumatic and hydraulic systems (10 marks)