071304T4EIN

ELECTRICAL INSTALLATION LEVEL 4

ENG/OS/EI/CR/03/4/A

Perform Electrical System Breakdown Maintenance

March/April 2025

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

WRITTEN ASSESSMENT

Time: 2 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections **A** and **B**.
2. Attempt **ALL** the questions in each section.
3. Marks for each question are indicated in the brackets.
4. You are provided with a separate answer booklet to answer the questions.
5. **DO NOT** write on the question paper.

This paper consists of SIX (6) printed pages

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

SECTION A (10 MARKS)

Attempt all questions in this section. Each question carries one mark

1. Testing a repaired piece of equipment ensures functionality and safety. What is the purpose of testing completed repairs on electrical equipment?
    A. Ensure technician skills are adequate
    B. Ensure future maintenance will not be required
    C. Ensure operators can properly operate equipment
    D. Ensure the system works properly
2. Protective devices are crucial for isolating circuits from faults. Which device trips to keep the system safe from short circuits?
    A. Earth.
    B. Live conductor.
    C. Circuit breaker
    D. Fuse
3. When maintaining an electrical system, safety is paramount. As a technician, what should you do to the power supply when working on an electrical system?
    A. Close and tag circuit breaker and main switch
    B. Open and tag circuit breaker
    C. Open and tag the circuit breaker and main switch
    D. Open and tag main switches
4. Proper troubleshooting methods simplify the process of fixing faults. What step makes troubleshooting a faulty machine easier?
    A. Review system operation, analyze symptoms, detect and isolate trouble
    B. Review system operation, clean and inspect, detect and isolate trouble
    C. Review system operation, analyze symptoms, perform clean/inspect
    D. Analyze symptoms, clean and inspect, detect and isolate

5. Periodic testing ensures the safety and functionality of electrical installations. Who is responsible for carrying out periodic testing on existing installations?
    A. Energy and regulatory commission
    B. Competent person
    C. Kenya Power
    D. Building Inspector
6. Maintenance of electrical machines is critical for proper functioning. What types of maintenance can be undertaken on an electrical machine which has broken down during operation?
    A. Periodic
    B. Preventive
    C. Breakdown
    D. All of the above
7. Faulty electrical appliances require specific tests to determine issues. Which test should be performed on a faulty electrical kettle?
    A. Earth test
    B. Loop impedance
    C. Insulation resistance test
    D. None of the above
8. Maintenance of electrical installations requires specific tools. Which of the following tools is NOT used for electrical installation maintenance?
    A. Tape measure
    B. Screw driver
    C. Pliers
    D. Wheel spanner
9. Noise in an electric motor often indicates a fault. What could cause a noisy operation in an electric motor?
    A. Burnt winding
    B. Open centrifugal switch
    C. Rotor and stator touched each other
    D. Open capacitor

10. Technicians use different tools for supply-on and supply-off checks. Which instrument is used during supply-off checks on machines and equipment?

    A. Insulation tester
    B. Voltmeter
    C. Ammeter
    D. Test lamp

SECTION B (40 MARKS)

Attempt ALL questions in this section.

11. Electrical system failures can significantly disrupt a processing industry. Identify THREE causes of system failures. (3 marks)
12. Preventive maintenance enhances the reliability and safety of electrical systems. Identify FOUR benefits of preventive maintenance (4 marks)
13. Periodic inspection and testing ensure the safety and compliance of electrical installations. Apart from wear and tear, state THREE areas of investigation that should be considered during Periodic inspection. (3 marks)
14. Electrical appliances often develop faults during operation. State TWO probable causes for an electric cooker coil that does not heat up. (2 marks)
15. Maintenance tasks require specific tools and equipment. State the uses of the following tools. (4 marks)
    i. Stock and die
    ii. Screw driver
    iii. Bending spring
    iv. Combinational pliers
16. Technicians often address common electrical faults during repair activities. List the probable causes and remedies for the following faults. (6 marks)

Problem	Cause	Remedy
i. Flickering or dimming lights		
ii. Cut or damaged extension cord		
iii. Simple short circuit		

17. Testing is a standard requirement for complete electrical installations. Identify THREE tests that should be carried out in a complete installation. (3 marks)
18. Safety during troubleshooting is critical for electrical technicians. State THREE safety tips that should be observed during troubleshooting. (3 marks)
19. Various tools are used for electrical system maintenance. Name FOUR tools commonly used in maintenance. (4 marks)

20. Electrical appliances can experience faults during operation. Identify TWO causes of an electric iron box failing to heat up. (2 marks)
21. Electrical equipment is generally designed to minimize electrical hazards. State THREE ways of protection against electric shock. (3 marks)
22. Carrying out an electrical test requires one to use various instruments in accordance to the established standards. Identify the functions of the following instruments. (3marks)
    i. Ohmmeter
    ii. Insulation resistance tester
    iii. Phase tester.