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071305T4EOP

ELECTRICAL OPERATOR (POWER OPTION) LEVEL 5

ENG/OS/PO/CR/07/5/A

PERFORM ELECTRICAL BREAKDOWN MAINTENANCE

July/August 2024

Time: 3 Hours

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

WRITTEN ASSESSMENT

3 HOURS

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INSTRUCTIONS TO CANDIDATES

1. This paper consists of **two** sections: **A** and **B**
2. Answer **all** questions in section A and **three** questions in section B in the answer booklet provided.
3. Marks for each question are as indicated.
4. Do not write on the question paper.
5. Answer the questions in **English**.

This question paper consists of Four (4) printed pages.

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

SECTION A: (40 MARKS)

Answer all questions in this section

1. Electrical Breakdown maintenance requires different tools and instruments. Name the most suitable tool or instrument for each of the following functions:
   a) Measures the resistance of electrical insulation to detect faults or deterioration
   b) Measures current flow in a conductor without the need for direct electrical contact
   c) Essential for loosening or tightening screws in electrical panels and devices
   d) Useful for gripping, bending, or cutting wires during electrical maintenance tasks

   (4 marks)
2. A comprehensive breakdown maintenance report is crucial for documenting the maintenance activities, identifying root causes, and ensuring proper follow-up actions. It serves as a valuable record for future reference and continuous improvement. List **four** key elements of a breakdown maintenance report. (4 marks)
3. Preventive maintenance is a proactive approach that offers numerous advantages compared to reactive breakdown maintenance. Explain **four** advantages of preventive maintenance over breakdown maintenance. (4 marks)
4. A comprehensive maintenance checklist helps ensure that all necessary inspections and tasks are performed. State **four** items that must be incorporated in the routine maintenance checklist of a transformer. (4 marks)
5. Maintenance engineers play a vital role in ensuring the reliable and efficient operation of electrical systems and equipment. Outline **four** duties of a maintenance engineer. (4 marks)
6. Proper storage and organization of maintenance tools are crucial for ensuring their accessibility, safety, and longevity. List **four** methods of storage of maintenance tools. (4 marks)
7. During breakdown maintenance activities, various types of waste materials may be generated, including hazardous and non-hazardous waste. Proper waste disposal methods are essential for maintaining a safe work environment and minimizing environmental impact. Name **four** methods of waste disposal during break down maintenance. (4 marks)
8. 'Servicing' and 'repairing' are two distinct terms used in electrical maintenance, each referring to different types of maintenance activities. Distinguish between ‘servicing’ and ‘repairing’ as used in electrical maintenance. (4 marks)

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9. A well-defined calibration procedure is essential for obtaining accurate and consistent measurements. Explain the procedure of calibrating an electrical instrument.

(4 marks)

10. Define the following terms as used in electrical Breakdown Maintenance.

a) Downtime:

b) Troubleshooting: (4 marks)

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SECTION B (60 MARKS)

*Answer **three** questions in this section. All questions carry equal marks.*

11. When repairing an electrical machine after a breakdown, it's crucial to follow safety precautions to protect yourself from potential hazards.
    a) Name four PEEs used during electrical breakdown maintenance. (4 marks)
    b) Explain four potential hazards during electrical breakdown maintenance. (8 marks)
    c) Explain four safety precautions that should be observed during electrical breakdown maintenance. (8 marks)
12. Testing a repaired electrical system is a critical step in the maintenance process, serving various purposes. One such test is continuity test.
    a) Explain **four** reasons why it is important to carry out tests on a repaired electrical system. (8 marks)
    b) Explain the procedure of carrying out continuity test on a repaired three phase induction motor. (12 marks)
13. Record keeping is a very important function by maintenance department.
    a) Name **four** personnel in maintenance department responsible for Record keeping. (4 marks)
    b) List **six** documents kept by the maintenance department. (6 marks)
    c) Explain **five** importance of record keeping in an organization. (10 marks)
14. Electrical systems can experience various types of faults, each with distinct characteristics and potential consequences.
    a) Identify **five** ways of diagnosing a fault. (5 marks)
    b) Highlight **six** steps in condition monitoring of an equipment (6 marks)
    c) Discuss **three** types of faults that can occur on an electrical system. (9 marks)

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