

071306T4EEN

ELECTRICAL TECHNICIAN (POWER OPTION) LEVEL 6

ENG/OS/PO/CC/03/6

Apply Workshop Processes

July/August 2024

Time: 3 Hours



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

WRITTEN ASSESSMENT

3 HOURS

INSTRUCTIONS TO CANDIDATES

1. This tool 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. Tools are essential for safely and effectively completing electrical installations, repairs, and maintenance tasks. List **five** tools used in Electrical work. (5 marks)
2. Personal protection helps to prevent major accidents in electrical workshops. Outline **three** types of Eye protectors. (3 marks)
3. Earthing is an important electrical requirement. Define the term Earthing. (2 marks)
4. IEE regulations are a set of guidelines primarily concerned with electrical installations in buildings. State **four** IEE regulations. (4 marks)
5. Electrical tools are categorized best on their application. Highlight **five** categories of Electrical tools. (5 marks)
6. Measuring instruments serve various purposes across different industries and applications. State **four** measuring instruments. (4 marks)
7. Uncontrolled fire poses significant risks to life, property, and the environment, making fire safety and prevention crucial aspects of modern society. Define the term Fire. (2 marks)
8. Electrical fires can occur due to various factors. List **five** Causes of fire. (5 marks)
9. Parts can be joined together by applying different methods. Outline **two** methods joining parts. (2 marks)
10. Maintaining workshop tools is crucial for ensuring their longevity and optimal performance. Highlight **three** ways of maintaining workshop tools. (3 marks)
11. The classification of fires is based on the type of material burning. List **five** classes of fire. (5 marks)

SECTION B (60 MARKS)

Answer any THREE questions from this section. Each question carries equal marks.

- 12.
- Electrical resistivity plays a crucial role in the design and performance of electrical and electronic systems. Different materials exhibit different resistivity values. Explain the term electrical resistivity. (2 marks)
 - A workshop technician is responsible for maintaining and repairing various types of equipment used in a manufacturing facility. Troubleshooting common problems with workshop equipment involves several steps. Outline the steps. (5 marks)
 - In a class of workshop process the trainer introduced a subject on metal processes. Discuss the following material properties:
 - Hardness;
 - Strength;
 - Ductility. (9 marks)
 - Calculate the resistance of an electrical conductor 1 mm diameter and 20 meters long, whose resistivity is $2.5 \times 10^{-8} \Omega/\text{m}$. (4 marks)
- 13.
- Fuses and circuit breakers are both electrical safety devices designed to protect electrical circuits from overcurrent conditions, but they operate in different ways and have distinct characteristics. Distinguish between Fuses and Circuit breakers. (4 marks)
 - With the aid of a well labelled diagram, explain the high rupturing capacity fuse. (12 marks)
 - Cartridge fuses are commonly used as overcurrent protection devices in many of our electrical products. State **four** parts of cartridge Fuse. (4 marks)
- 14.
- Safety is a fundamental aspect of human well-being and is essential in various contexts, including personal, occupational, environmental, and public health. Define the term “Safety”. (2 marks)
 - A safety engineer responsible for ensuring proper safety protocols and signage are in place at a cables manufacturing plant. Discuss **four** types of Safety signs. (8 marks)
 - Safety is a top priority in any workplace, and we all need to cultivate good safety habits to prevent accidents and incidents. Explain **five** safety working habits. (10 marks)

15.

- a) A workshop instructor is teaching a course on basic hand tools used in various engineering and manufacturing disciplines, the engineer's file is a versatile hand tool. Explain its function. (2 marks)
- b) In electrician toolbox two tools look similar but seem to serve different purposes, a precision steel rule and a center punch. Distinguish between precision steel rule and Center punch. (4 marks)
- c) A workshop supervisor is responsible for ensuring a safe working environment for all employees as safety is an important aspect at work place. Discuss **five** safety precautions in the workshop. (10 marks)
- d) An electrical engineer working in a manufacturing facility that relies heavily on various electrical equipment and systems. Explain **two** importance of maintenance of electrical equipment. (4 marks)

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