

071304T4RAC

Refrigeration and Air Conditioning Technician - Level 4

ENG/OS/RAC/CC/02/4/A

Perform Electrical and Electronic Circuitry

July/ August 2023



**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. Answer **ALL** questions in section **A** and **B**
3. Maximum marks for each part of a question are as indicated.
4. You are provided with a separate answer booklet.
5. Marks for each question are indicated in the brackets.
6. Do not write on this question paper

This paper consists of Five (5) printed pages. Candidates should check the questions paper to ascertain that all the pages are printed as indicated and that no questions are missing.

SECTION A: (10 Marks)

Attempt ALL questions in this section.

1. The watt is a unit for _____
 - A. Power
 - B. Voltage
 - C. Energy
 - D. Quantity of electricity
2. _____ statement is correct.
 - A. $1\text{N} = 1\text{kgm/s}^3$
 - B. $1\text{V} = 1\text{J/A}$
 - C. $1\text{pF} = 1 \times 10^{-12}\text{F}$
 - D. $1\text{J} = 1\text{N/m}$
3. The SI unit for current _____.
 - A. Farad
 - B. Ohm
 - C. Henry
 - D. Ampere
4. Ten 3F capacitors are connected in parallel. The effective capacitance of the circuit is _____
 - A. $0.3\text{F}\Omega$
 - B. 30F
 - C. 0.033F
 - D. 0.06F
5. _____ is an electrical accessory.
 - A. Digital multimeter
 - B. Phase tester
 - C. Wrenches
 - D. Bulb holder
6. The statement that best describes the definition of electrical power is _____.
 - A. electrical energy running in a circuit
 - B. the product of voltage and current in a circuit
 - C. the algebraic sum of all branch currents and voltages

- D. the product of resistance and current in a circuit
7. The power dissipated by a resistor of 100Ω when a current of 0.02A passes through is ____
- A. 2W
 - B. 200W
 - C. 50W
 - D. 5kW
8. The personal protective equipment (PPE) that is highly necessary while working on or near high voltage power line is _____.
- A. Hand gloves
 - B. Overall/ dustcoat
 - C. Eye goggles
 - D. Facemasks
9. _____ is a safety device for protection against overload currents.
- A. Fuses
 - B. MCB's
 - C. Switch fuse
 - D. All the above
10. Free electrons in a n-type material are _____
- A. are majority carriers
 - B. exist in the same numbers as holes
 - C. are minority carriers
 - D. exist in the same numbers as holes

SECTION B: (40 Marks)*Attempt ALL questions in this section*

11. Define the term hazard (2 marks)
12. Name THREE common hazards that occur in workshops (3 marks)
13. Draw the symbols of the following electrical and electronic components. (5 marks)
- Capacitor
 - Resistor
 - Ground symbol
 - Cell
 - Transformer
- 14.
- Define the term sensor circuit. (2 marks)
 - Name FOUR components of a sensor circuit (4 marks)
15. If 5A, 10A, 13A and 25A fuses are available, state which is most appropriate for the following appliances which are both connected to a 240 V supply: (4 marks)
- Electric toaster having a power rating of 1 kW
 - Electric cooker unit having a power rating of 5 kW.
16. Outline SIX key steps used when locating an electrical fault. (6 marks)
17. Define orthographic projection as used in technical drawing. (2 marks)
18. For figure 1 shown, sketch the orthographic views for
- Front elevation / front view
 - Top elevation / Plan
 - End elevation / side view (6 marks)

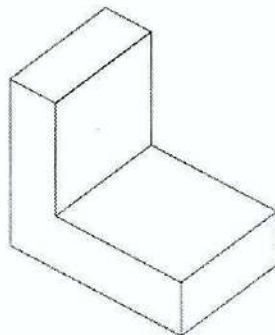


Figure 1.

19. Name any TWO electronic components used in electrical circuits. (2 marks)
20. Differentiate between AC and DC current (2 marks)
21. List TWO sources of DC power. (2 marks)

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