



LIMPOPO
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION

CAPRICORN SOUTH DISTRICT

GRADE 10

PHYSICAL SCIENCES

TOPIC TEST 05

ELECTRIC CIRCUITS

16.04.2026

MARKS: 25

DURATION: 35 Minutes

This Question paper consists of 05 (FIVE) Pages.

INSTRUCTIONS AND INFORMATION

1. Answer ALL your questions in your answer book
2. This question paper consists of two questions
3. Start EACH question on a NEW page in the ANSWER BOOK
4. Number the answers correctly according to the numbering system used in this question paper
5. Leave ONE line between two sub-questions, e.g. between QUESTION 2.1 and QUESTION 2.2.
6. You may use a non-programmable calculator.
7. You may use appropriate mathematical instruments.
8. Show ALL formulae and substitutions in ALL calculations.
9. Round off your FINAL numerical answers to a minimum of TWO decimal places.
10. Give brief motivation, discussions, etc. where required.
11. You are advised to use the attached DATA SHEETS
12. Write neatly and legibly

QUESTION 1: MULTIPLE-CHOICE QUESTIONS

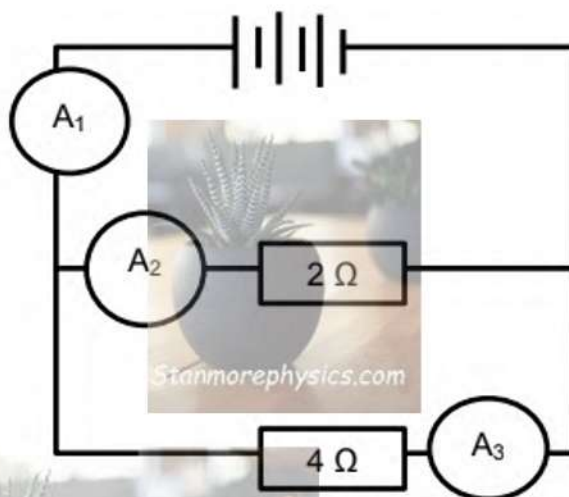
Four possible options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A – D) next to the question numbers (1.1 to 1.2) in the ANSWERBOOK, e.g. 1.2 E.

1.1 Which one of the following is the equivalent unit for potential difference?

- A. W.h
- B. J·C
- C. J·C⁻¹
- D. C·J⁻¹

(2)

1.2 Consider the circuit diagram below.



How will the readings on ammeters A₁, A₂ and A₃ compare with each other?

- A. $A_1 = A_2 = A_3$
- B. $A_1 = A_2 + A_3$
- C. $(A_2 + A_3) > A_1$
- D. $A_2 < A_3 < A_1$

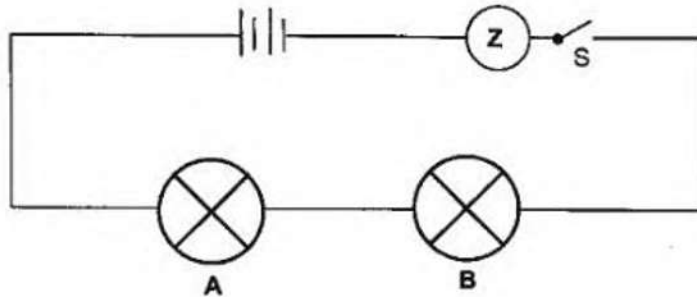
(2)

[4]

QUESTION 2

2.1 Two identical bulbs, **A** and **B** as well as a measuring device **Z**, are connected to a battery as shown in the diagram below.

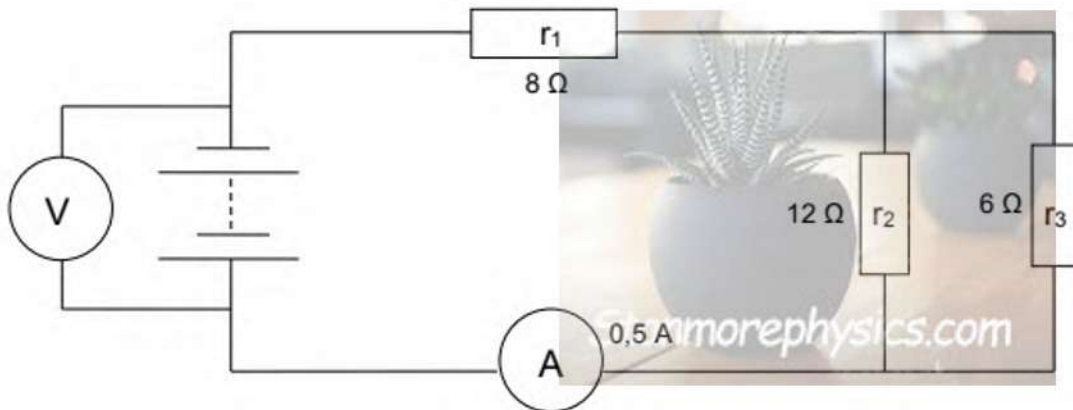
The switch **s** is initially open.



2.1.1 Which physical quantity will device **Z** measure when the switch **s** is closed? Give a reason for your answer (2)

2.1.2 How does the brightness of bulb **A** compare to that of bulb **B**? Choose: Greater than, Equal, or Less than. Give a reason for your answer (2)

Study the following circuit diagram. The battery has an unknown EMF. Resistor r_1 has a resistance of $8\ \Omega$, resistor r_2 has a resistance of $12\ \Omega$, and resistor r_3 has a resistance of $6\ \Omega$. Ammeter **A** gives a reading of $0,5\ \text{A}$.

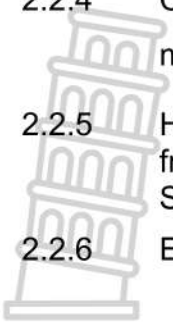


2.2.1 Calculate the total resistance of the circuit. (5)

2.2.2 Define the term voltage in words (2)

2.2.3 Calculate the reading on voltmeter **V**. (3)

- 2.2.4 Calculate the amount of charge that flows through the ammeter in 5 minutes. (3)
- 2.2.5 How will the ammeter reading A be influenced if resistor r_3 is removed from the circuit? Write down INCREASE, DECREASE or STAY THE SAME. (1)
- 2.2.6 Explain your answer to question 2.2.5 without using calculations. (3)



------(25)-----

DATA FOR PHYSICAL SCIENCES GRADE 10

PAPER 1 (PHYSICS)

ELECTRIC CIRCUITS/ ELEKTRIESE STROOMBANE

$Q = I\Delta t$	$V = IR$
$V = \frac{W}{Q}$	$R_S = R_1 + R_2 + R_3 \dots$
$\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2}$	



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MARKING GUIDELINES

Stanmorephysics.com

MARKS : 25

DURATION: 35 MINUTES

This memorandum consists of 3 pages

QUESTION 1

- 1.1 C ✓✓ (2)
1.2 B ✓✓ (2)

QUESTION 2

2.1

2.1.1 Current ✓ (2)
An ammeter is always connected in series to measure the current flowing through the circuit. ✓

2.1.2 Equal ✓ (2)
The bulbs are identical and in series, so the same current flows through both, making their brightness the same. ✓

[4]

2.2.1 $\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$ ✓



Accept any other valid method

$$= \frac{1}{6} + \frac{1}{12} \quad \checkmark$$
$$R_p = 4\Omega \quad \checkmark$$
$$R_T = 4 + 8 \quad \checkmark$$
$$R_p = 12\Omega \quad \checkmark$$

(5)

2.2.2 Work done per coulomb of charge ✓✓

Or

(2)

Energy supplied per coulomb of charge ✓✓

2.2.3 $v = IR$ ✓

$= (0,5)(12)$ ✓

(3)

$v = 6V$ ✓

2.2.4 $Q = I \times \Delta t$ ✓

$= (0,5)(300)$ ✓

$= 150 C$ ✓

(3)

2.2.5 DECREASE ✓

(1)

2.2.6 Total resistance increases ✓

(3)

Current is inversely proportional to resistance, therefore current decreases ✓✓

[GRAND TOTAL 25]

