



# education

Department of  
Education  
FREE STATE PROVINCE

**EXPERIMENT**

**GRADE 10**

**TECHNICAL SCIENCES**

**JUNE 2018**

**MARKS: 15**

**TIME: 30 MINUTES**

**This paper consists of FOUR pages.**

Name of learner: .....

Grade: .....

## **INSTRUCTIONS AND INFORMATION**

1. Write your name and grade in the appropriate spaces on the FRONT PAGE of this question paper.
  2. Answer ALL questions in the spaces provided in THIS QUESTION PAPER.
  3. Give brief motivations, discussions, et cetera where required.
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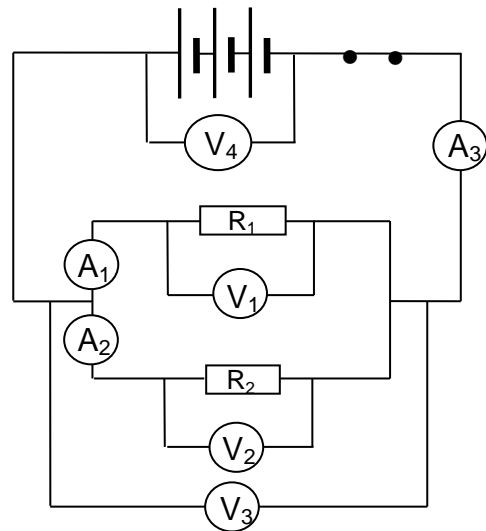
## QUESTION 1

Two learners found the following part of a worksheet and decided to do the investigation.

AIM: To compare the potential differences across resistors in parallel with the potential difference across each of the resistors in parallel and to compare the current in each branch with the main current in the circuit.

### APPARATUS

- Three 1,5 V cells
- Two resistors
- Four voltmeters
- Three ammeters
- Conducting wires
- Switch
- Circuit board



1.1 Write down a hypothesis for the potential difference mentioned in the aim. (2)

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1.2 After building the circuit all the ammeters show readings of 0 A, although the switch is closed. One ammeter is broken and needs to be replaced.

1.2.1 Which ammeter is broken? (1)

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1.2.2 Which ammeter measures the total current? (1)

\_\_\_\_\_

1.3 Calculate the reading on  $V_4$ . Disregard the internal resistance of the cells. (1)

\_\_\_\_\_

1.4 Use your answer calculated in question 1.3 and complete the following table.

	<b>Voltmeter reading <math>V_4</math> (V)</b>	<b>Voltmeter reading <math>V_1</math> (V)</b>	<b>Voltmeter reading <math>V_2</math> (V)</b>	<b>Voltmeter reading <math>V_3</math> (V)</b>
<b>Trail 1</b>				

(2)

1.5 When the relationships between the ammeters and voltmeters are investigated, a decision has to be made how to connect them. How must these meters be connected with the rest of the circuit components? (2)

Ammeters: \_\_\_\_\_

Voltmeters: \_\_\_\_\_

1.6 The following results were obtained for the ammeters.

	<b><math>A_1</math> (A)</b>	<b><math>A_2</math> (A)</b>	<b><math>A_3</math> (A)</b>
<b>Trial 1</b>	0,75	0,75	1,5

1.6.1 What are the relationships between the ammeter readings? (2)

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1.6.2 What conclusion can be drawn regarding the current in a parallel circuit? (1)

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1.6.3 What will the reading on  $A_1$  be when the switch is opened? (1)

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1.6.4 Complete the following sentence to summarise the investigation. (2)

Resistors in parallel are \_\_\_\_\_ dividers and the

\_\_\_\_\_ in a parallel circuit is the same across all branches.

[15]