



education

Department of  
Education  
FREE STATE PROVINCE

**GRADE 9**

**NATURAL SCIENCES**

**NOVEMBER 2017**

**MEMORANDUM**

**MARKS: 100**

**This memorandum consists of 7 pages.**

## SECTION A

### QUESTION 1

- |      |    |             |
|------|----|-------------|
| 1.1  | C✓ | (1)         |
| 1.2  | B✓ | (1)         |
| 1.3  | D✓ | (1)         |
| 1.4  | C✓ | (1)         |
| 1.5  | D✓ | (1)         |
| 1.6  | D✓ | (1)         |
| 1.7  | C✓ | (1)         |
| 1.8  | B✓ | (1)         |
| 1.9  | D✓ | (1)         |
| 1.10 | C✓ | (1)         |
|      |    | <b>[10]</b> |

### QUESTION 2

- |     |                     |            |
|-----|---------------------|------------|
| 2.1 | Contact. ✓          | (1)        |
| 2.2 | Electric current. ✓ | (1)        |
| 2.3 | Transformers. ✓     | (1)        |
| 2.4 | Battery. ✓          | (1)        |
| 2.5 | Conductors. ✓       | (1)        |
|     |                     | <b>[5]</b> |

### QUESTION 3

- |     |    |            |
|-----|----|------------|
| 3.1 | C✓ | (1)        |
| 3.2 | E✓ | (1)        |
| 3.3 | A✓ | (1)        |
| 3.4 | F✓ | (1)        |
| 3.5 | B✓ | (1)        |
|     |    | <b>[5]</b> |

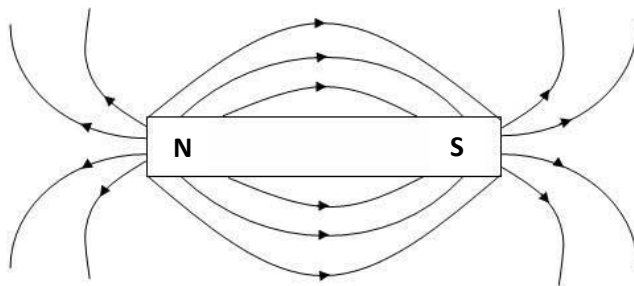
## SECTION B

### QUESTION 4

4.1.1 No, ✓ aluminium is non-magnetic. ✓ (2)

4.1.2 Bar D ✓, nickel is magnetic ✓. (2)

4.2



✓✓✓

(3)

4.3.1 Negative ✓ (1)

4.3.2 Negative ✓ (1)

4.3.3 Positive ✓ (1)

4.3.4 Positive ✓ (1)

[11]

### QUESTION 5

- 5.1.1 What is the effect of the length of the resistor on the resistance of the resistor? ✓✓ (2)

OR

Does the length of a resistor has an effect on the resistance of the resistor? ✓

- 5.1.2 Length. ✓ (1)

- 5.1.3 resistance. ✓ (1)

- 5.1.4 The longer the resistor✓, the higher the resistance.✓ (2)

OR

The shorter the resistor✓, the lower the resistance.✓

OR

As the length of the resistor increases✓, the resistance increases.✓

OR

As the length of the resistor decreases✓, the resistance decreases.✓

- 5.1.5 0,08 ohms. ✓✓ (2)

- 5.2.1 Turbine. ✓ (1)

- 5.2.2 Generator✓ OR the armature inside the generator. ✓ (1)

- 5.3 **X – Transformer**, ✓, it is used to **step-down high voltages✓ to lower voltages✓** (2)  
[13]

## QUESTION 6

6.1.1  $V_2$  and  $V_3 = 9V$ ✓ (1)

6.1.2 6A, ✓ when switch  $S_2$  is opened the circuit becomes a series circuit, ✓  
therefore all the current goes through the branch  $A_2$ ✓. (3)

6.1.3 Bulb A has the higher resistance. ✓. Bulb A has smaller current which  
goes through it, therefore it must have higher resistance. ✓ (2)

6.2.1 B✓ (1)

6.2.2 The bulbs in B are in parallel; lower resistance, higher current, brighter  
bulbs. ✓ (1)

6.2.3 **A:** All the bulbs will stop glowing, because the bulbs are in series. There  
is not an alternative path for the current to flow through. ✓ (1)

**B:** The two bulbs in the other parallel branch will still glow. The bulbs are  
in parallel and there is an alternative path for the current to flow through. ✓(1)

6.2.4 B✓ (1)

6.2.5 B✓ (1)

6.3.1 3-Earth wire ✓ (1)

5- Fuse✓ (1)

6.3.2 Part 3 is the earth leakage wire. It removes current from an appliance  
if it picks up a difference in the amount of current entering the appliance  
and the current flowing in the appliance. If there is a difference, the current is  
redirected down the earth wire. ✓✓ (2)

**OR**

If the metal casing of an appliance becomes charged due to a fault, the  
charge is safely discharged to the ground via the earth wire. ✓✓

**OR**

The earth wire conduct the current away from the appliance through the  
earth wire when a short circuit occurs; protecting the user of the appliance  
from an electric shock. ✓✓

6.4.1 Total energy consumption =  $2000 \text{ W} \checkmark \times 0,033 \text{ h} \checkmark$   
 $= 66 \text{ kWh} \checkmark$  (3)

6.4.2 Cost = power rating  $\times$  hour  $\times$  unit price  $\checkmark$   
 $= 2000 \times 0,033 \times 120 \checkmark$   
 $= 8000 \text{ c/ 100}$   
 $= \text{R}80 \checkmark$  (3)

6.5 Any two methods - also consider alternative answers.  $\checkmark \checkmark$  (2)

- Using solar-panel water-heaters instead of electric geysers.
- By using geyser blankets.
- Switching off appliances when not using them.
- Drying washing in the sun rather than in a tumble dryer.
- Using low-wattage appliances such as energy-saving light bulbs.

[25]

## QUESTION 7

7.1 Lithosphere  $\checkmark$ : the outer layer of the earth that consists of rocks and soil. (2)

Atmosphere  $\checkmark$ : the layer of air around the earth.  $\checkmark$  (2)

Hydrosphere  $\checkmark$ : layer of the earth that consists of water.  $\checkmark$  (2)

Biosphere  $\checkmark$ : the part of the earth where life exists.  $\checkmark$  (2)

7.2.1 Outer core.  $\checkmark$  (1)

7.2.2 Mantle.  $\checkmark$  (1)

7.2.3 Inner core.  $\checkmark$  (1)

7.2.4 Crust.  $\checkmark$  (1)

[12]

### QUESTION 8

- |    |                |            |
|----|----------------|------------|
| 1- | Sedimentary. ✓ | (1)        |
| 2- | Igneous. ✓     | (1)        |
| 3- | Metamorphic. ✓ | (1)        |
| 4- | Coal. ✓        | (1)        |
| 5- | Limestone. ✓   | (1)        |
| 6- | Sandstone✓.    | (1)        |
| 7- | Granite. ✓     | (1)        |
| 8- | Basalt. ✓      | (1)        |
| 9- | Marble. ✓      | (1)        |
|    |                | <b>[9]</b> |

### QUESTION 9

- |     |   |             |
|-----|---|-------------|
| 9.1 | Greenhouse Effect✓  | (1)         |
| 9.2 | Climate change✓   | (2)         |
|     | Rising sea levels✓  |             |
|     | Food shortage✓  |             |
|     | Mass extinction✓ ( <b>Any two</b> )                                   |             |
| 9.3 | Carbon dioxide✓   | (1)         |
|     | Water vapour✓   | (1)         |
|     | Methane✓  | (1)         |
| 9.4 | • Solar energy enters the atmosphere✓                                 | (1)         |
|     | • Some energy is reflected back✓                                      | (1)         |
|     | • Most energy entering the atmosphere is trapped by greenhouse gases✓ | (1)         |
|     | • This result in rise in temperature✓                                 | (1)         |
|     |   | <b>[10]</b> |

**TOTAL SECTION B: 80**  
**GRAND TOTAL: 100**