



GRADE 8

NATURAL SCIENCES

SEPTEMBER 2017

TIME: 1 HOUR

MARKS: 50

**INSTRUCTIONS:**

1. The paper consists of TWO SECTIONS divided into SIX questions. Answer all the questions.
2. Number all questions exactly as in the question paper.
3. In case of calculations show all steps as well as all substitutions.

**SECTION A****QUESTION 1**

- 1.1 Various options are provided as possible answers to the following questions. Choose the answer and only write down the letter (A – D) of the correct answer next to the question number (1.1.1 – 1.1.10), for e.g. 1.1.12 B.

1.1.1 A neutral object has ...

- A more protons than electrons.
- B more electrons than protons.
- C the same number of electrons and protons.
- D no protons or electrons.

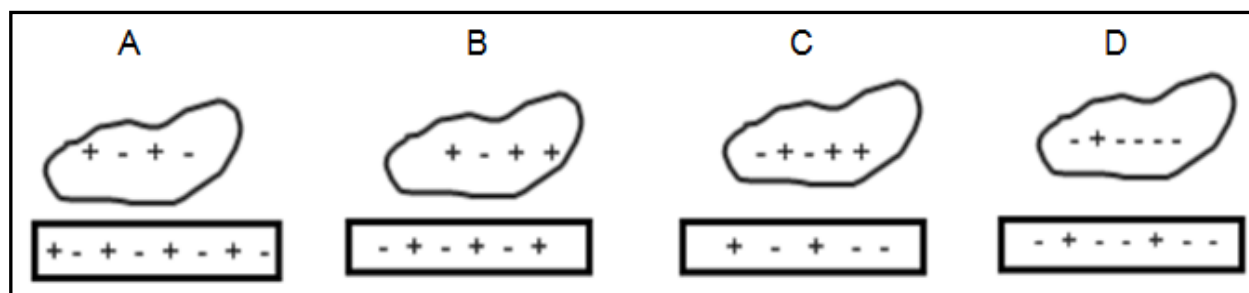
(1)

1.1.2 The transfer of ... is responsible for the formation of a positively charged object.

- A electrons
- B protons
- C neutrons
- D nucleons

(1)

1.1.3 A neutral rod is rubbed with a neutral cloth. Which one of the following diagrams best represent the particles in the rod and cloth AFTER rubbing them together?



(1)

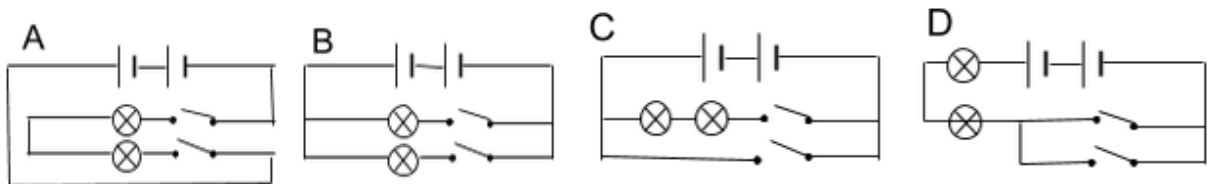
1.1.4 An electric current can be described as ...

- A static electricity.
- B something that causes resistance.
- C the movement of protons.
- D the movement of charges. (1)

1.1.5 A parallel circuit ...

- A has only one pathway for the current to flow through.
- B has two or more pathways for the current to flow through.
- C is never used in household wiring.
- D does not divide the total current supplied by the cells. (1)

1.1.6 An electric circuit consists of two light bulbs, two switches and two cells. In which one of the following diagrams are the two light bulbs connected in parallel with each other?

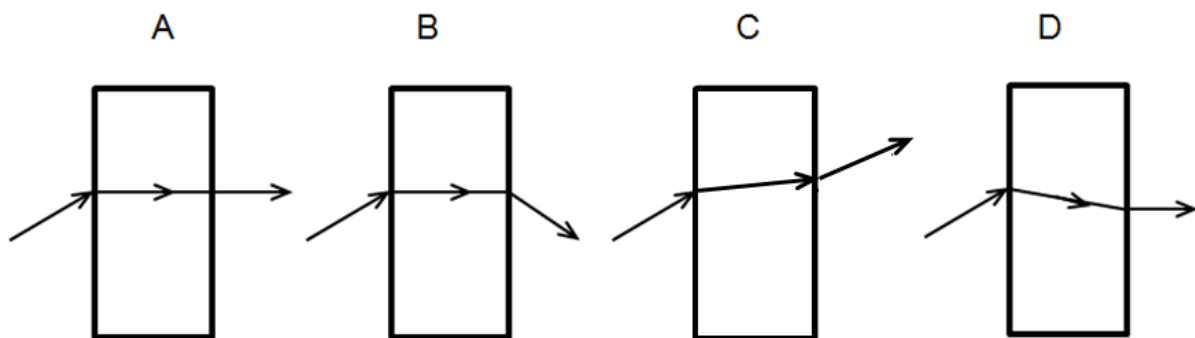


(1)

1.1.7 If the frequencies of different rays of visible light differ, ...

- A the intensity of the light rays will differ.
- B the colours of the light rays will differ.
- C then refraction of these light rays becomes impossible.
- D it is impossible that they all come from the same source. (1)

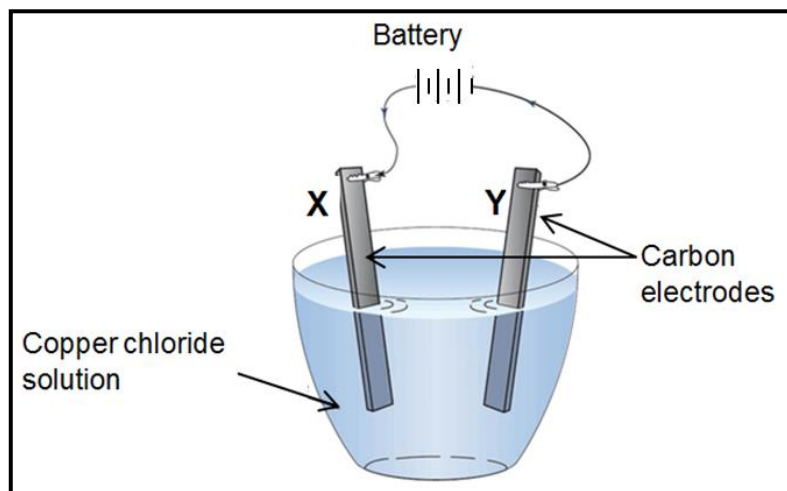
1.1.8 Which diagram shows the path of a ray of light through a rectangular glass block?



(1)

Consider the following picture of a process called electrolysis which is used to break down copper chloride into copper metal and chlorine gas.

Use the information in the picture and answer questions **1.1.9** and **1.1.10**.



1.1.9 Electrode Y is the ...

- A anode where brown copper metal is deposited.
- B cathode where brown copper metal is deposited
- C anode where chlorine gas is release.
- D cathode where chlorine gas is release.

(1)

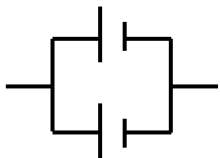
1.1.10 What energy conversion is taking place during this process?

- A Electrical energy is converted to chemical energy.
- B Chemical energy is converted to electrical energy.
- C Heat energy is converted to electrical energy
- D Chemical energy is converted to heat energy

(1)

**[10]**

- 1.2 Choose the description from COLUMN B that best matches the word in COLUMN A. Write only the letter (A - H) next to the question number (1.2.1 - 1.2.5).

COLUMN A		COLUMN B	
1.2.1	Current strength	A	Measured with a voltmeter.
1.2.2	Fuse	B	Battery consisting of two cells connected in parallel.
1.2.3		C	Takes place at the surface of a mirror.
1.2.4	Black	D	All colours of light mixed together.
1.2.5	Refraction	E	Measured with an ammeter.
		F	Light bends when it moves from one medium to another.
		G	All frequencies of white light are absorbed.
		H	Safety device which contains a special wire which can melt.

[5]

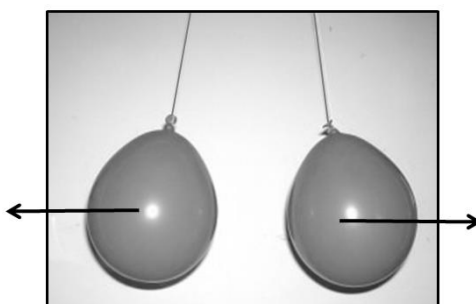
**TOTAL SECTION A: 15**

**SECTION B****QUESTION 2**

Peter charged a rubber balloon negatively by rubbing it against his hair. He then held the balloon against a brick wall and realised that the balloon was attracted to the wall to such an extent that the balloon got stuck to the wall.



- 2.1 Name the particles which are responsible for causing the **NEGATIVE** charge on the balloon. (1)
- 2.2 Name the **PROCESS** of charging the balloon by rubbing it against Peter's hair. (1)
- 2.3 Explain why the negatively charged balloon sticks to the wall. (2)
- 2.4 Peter charges a second balloon in the same way as in the first part of his experiment. He then ties both the balloons to a piece of string and let them hang freely.



When the two balloons are brought closer to one another, they push each other away. Explain this observation. (2)

**[6]**

**QUESTION 3**

To build a simple electric circuit is an easy way to determine how different circuit components affect each other.

Draw a circuit diagram that consists of the following components:

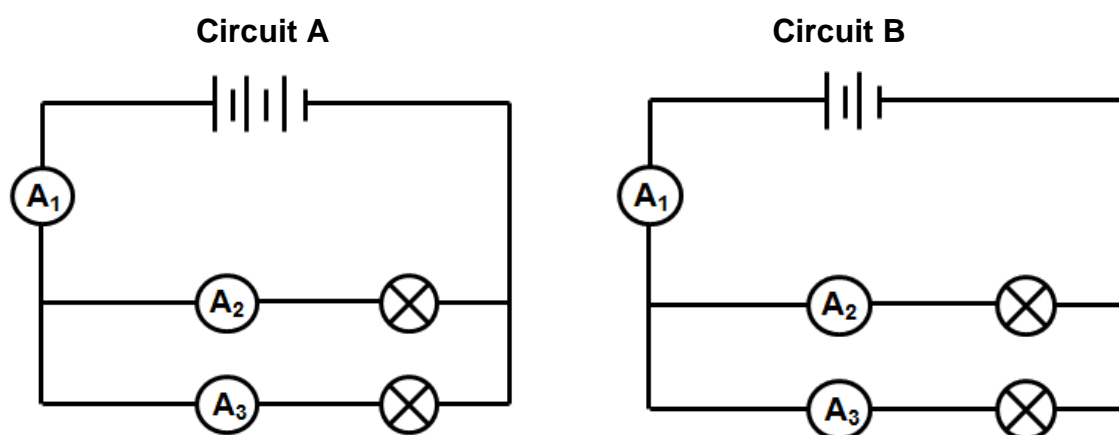
- A battery consisting of three cells connected in series.
- Two light bulbs connected in series with each other.
- A resistor that is connected in series with the battery and the light bulbs.
- An open switch connected in series with the battery.

**[4]****QUESTION 4**

Thabo has set up an experiment to determine the effect of the number of cells connected in SERIES on the brightness of two bulbs which are connected in parallel.

The experimental setup is displayed below as **circuit A** and **circuit B**.

Study the two circuit diagrams and answer the questions that follow. All the cells and all the bulbs are identical.

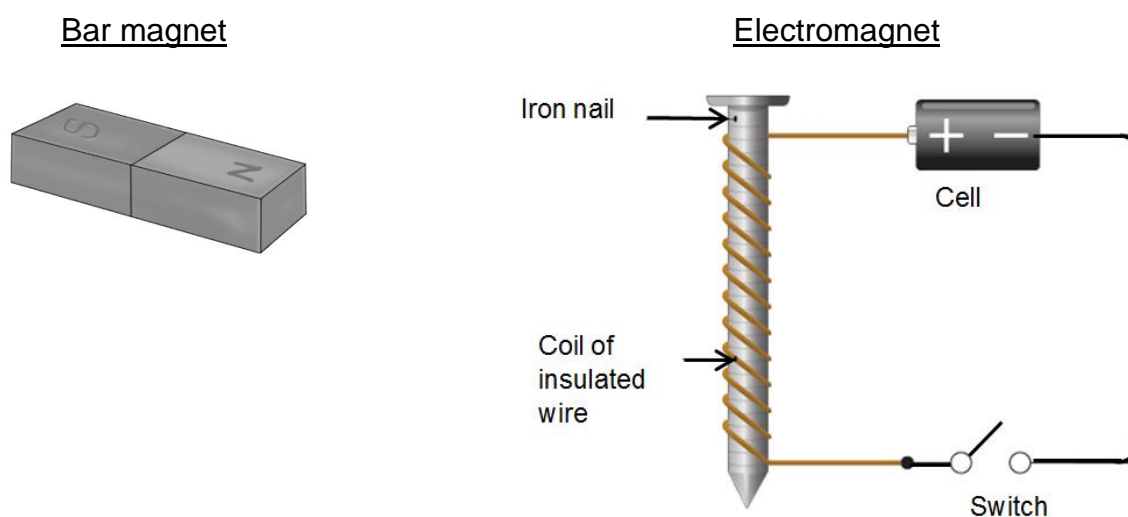


- 4.1 Draw the symbol of the component which is used to measure current in an electric circuit. (1)
- 4.2 Identify the following variables in the above experiment:
  - 4.2.1 Independent variable. (1)
  - 4.2.2 Dependent variable. (1)
- 4.3 Identify TWO controlled variables for this investigation. (2)
- 4.4 Write down a hypothesis for Thabo's experiment. (2)

- 4.5 In which circuit (A or B) will the light bulbs burn the brightest? (1)
- 4.6 Give a reason for your answer in question 4.5. (1)
- 4.7 What would the effect on the brightness of the two bulbs in circuit A be if one more bulb is connected in parallel with the existing bulbs ?  
Explain your answer. (3)
- [12]**

### QUESTION 5

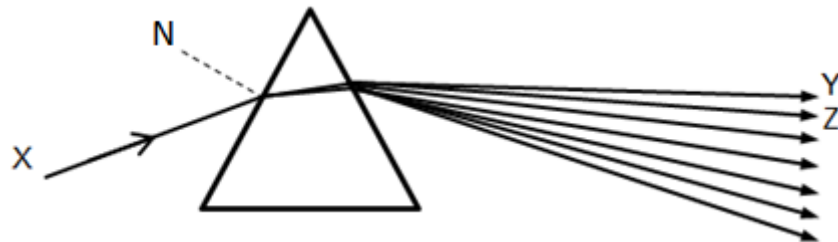
Study the diagrams of a bar magnet and of an electromagnet. Answer the questions that follow.



- 5.1 Which one of the two magnets is considered to be a permanent magnet?  
Explain your answer. (2)
- 5.2 Name two ways in which you can increase the magnetic force of the electromagnet. (2)
- 5.3 Give one example of using an electromagnet in everyday life. (1)
- [5]**

**QUESTION 6**

When a beam of light falls onto a glass prism, it breaks up into seven different colours as shown in the diagram below. Answer the questions that follow.



- 6.1 Write down the colours of light, represented by X, Y and Z in the diagram. (3)
- 6.2 Name the dotted line in the diagram indicated by N. (1)
- 6.3 Give the **scientific term** for:
- 6.3.1 white light splitting up into seven colours when passing through a triangular glass prism. (1)
- 6.3.2 the range of seven different colours of light which is observed. (1)
- 6.4 Refer to light that is absorbed and reflected and explain why a leaf appears green when white light shines on it. (2)

**[8]**

**TOTAL SECTION B: 35**  
**GRAND TOTAL: 50**