



education

Department of
Education
FREE STATE PROVINCE

GRADE 8

NATURAL SCIENCES

NOVEMBER 2017

MARKS: 70

TIME: 1½ HOURS

This question paper consists of 14 pages.

INSTRUCTIONS AND INFORMATION:

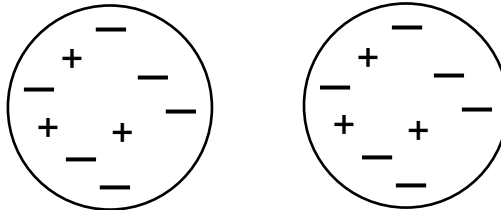
1. The question paper consists of TWO sections divided into SIX questions.
2. Answer ALL the questions in the ANSWER BOOK.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Leave one line between two sub-questions, for example between QUESTION 2.1 and QUESTION 2.2.
5. You may use a non-programmable pocket calculator.
6. Show ALL steps and substitutions in ALL calculations.
7. Round off your final numerical answers to TWO decimal places where applicable.
8. Write neatly and legibly.

SECTION A

QUESTION 1

- 1.1 Four options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK.

1.1.1 Study the two objects in the drawing below.



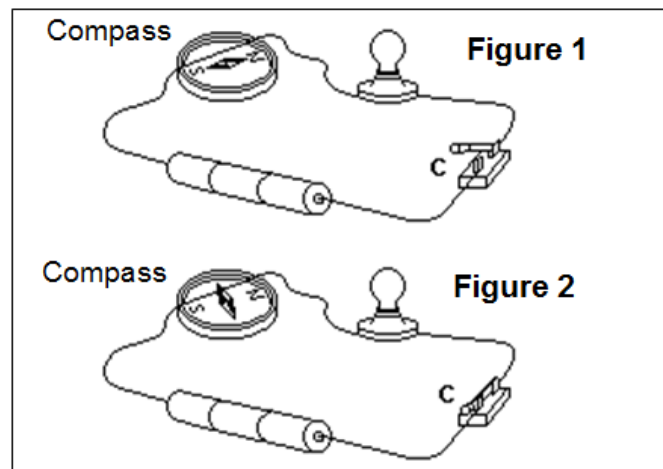
The two objects will ...

- A attract each other because they carry like charges.
- B attract each other because they carry unlike charges.
- C repel each other because they carry unlike charges.
- D repel each other because they carry like charges. (1)

1.1.2 What is the source of energy in an electric circuit?

- A Filament
- B Closed switch
- C Cell
- D Resistor (1)

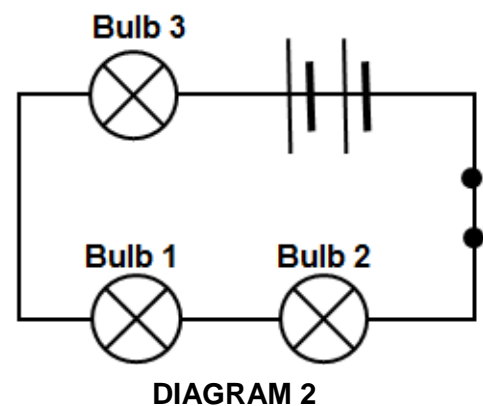
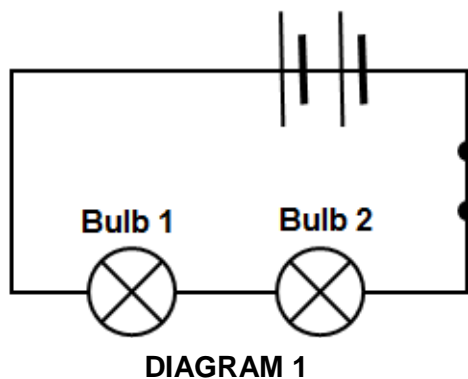
1.1.3 Study FIGURE 1 and 2.



When the switch in FIGURE 1 is closed, the needle of the compass rotates as seen in FIGURE 2. This proves that ...

- A an electric current can cause a chemical reaction.
- B when a current flows, the wire has a magnetic field around it.
- C when the current is too big, the fuse melts.
- D when a current flows through a resistor, it heats up. (1)

1.1.4 The bulbs in DIAGRAM 1 are glowing. A third bulb is added to the circuit as shown in DIAGRAM 2.



What will be observed in **DIAGRAM 2**?

- A Bulb 1 and 2 do not glow anymore.
- B Bulb 1 and 2 glow brighter than before.
- C The brightness of bulbs 1 and 2 is less than before.
- D The brightness of bulbs 1 and 2 is the same as before. (1)

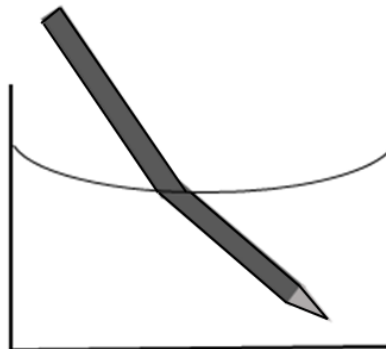
1.1.5 In a parallel circuit ...

- A there are two or more pathways for the current to pass through.
- B there is only one pathway for the current to pass through.
- C the overall current decreases as more bulbs are added.
- D bulbs cannot be individually switched on an off. (1)

1.1.6 Which statement regarding visible light is TRUE?

- A Red light has the highest frequency of all the colours of visible light.
- B Light travels at 3 000 kilometres per second through an empty space.
- C Opaque substances can absorb or reflect light.
- D The rainbow consists of red, green and blue light only. (1)

1.1.7 The fact that a pencil appears to be bent if it is placed in water, is due to ...



- A reflection.
- B refraction.
- C dispersion.
- D absorption. (1)

1.1.8 Which planet is the third planet from the Sun?

- A Earth
- B Saturn
- C Venus
- D Neptune (1)

1.1.9 Which ONE of the following is an example of a luminous object?

- A A mirror
- B The sun
- C The moon
- D A blue shirt (1)

1.1.10 Alpha Centauri is ...

- A the biggest star in our galaxy.
- B the nearest star to the Earth.
- C the furthest star that we can observe.
- D the closest star to the Sun.

(1)

[10]

- 1.2 Choose a word from COLUMN B that matches a description in COLUMN A. Write only the letter (A – J) next to the question number (1.2.1 – 1.2.5) in the ANSWER BOOK.

COLUMN A	COLUMN B
1.2.1 The Sun and its planets	A Universe
1.2.2 The path that one object takes when moving around another object	B Solar system
1.2.3 The force of attraction between objects which have mass	C Electrostatic forces
1.2.4 A region of asteroids just beyond Neptune; short period comets come from here	D Ampere
1.2.5 When an asteroid enters Earth's atmosphere it is called a ...	E Route
	F Gravity
	G Kuiper belt
	H Comet
	I Meteor
	J Orbit

[5]

TOTAL SECTION A: 15

SECTION B

QUESTION 2

Explosions have been known to occur at petrol stations when static electricity is discharged when a person handles the nozzle to put petrol in the car.

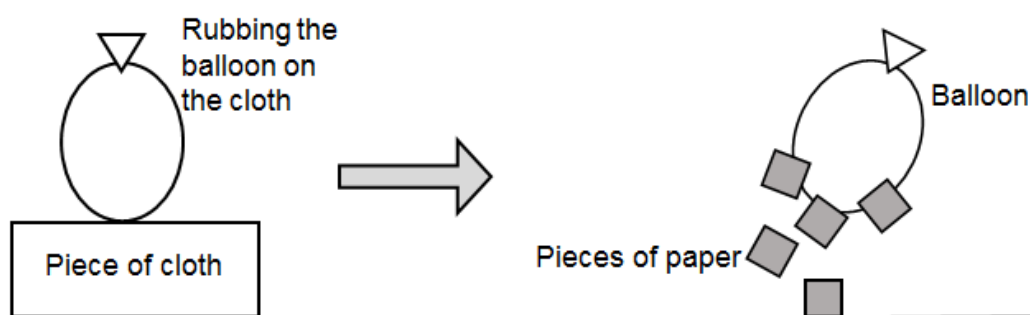


While the attendant walks up and down, rubbing takes place between the different parts of his clothes, which can cause a build-up of static electricity.

2.1 Explain what is meant by a **discharge** and how this can cause a fire or an explosion. (2)

2.2 Theto wonders which type of material is most suitable for making the work uniforms for petrol attendants.

He conducts an investigation by rubbing four identical balloons, each with a different piece of cloth. The pieces of cloth are respectively made of cotton, polyester, nylon and silk. He then determines how many pieces of paper can be picked up by each of the charged balloons.

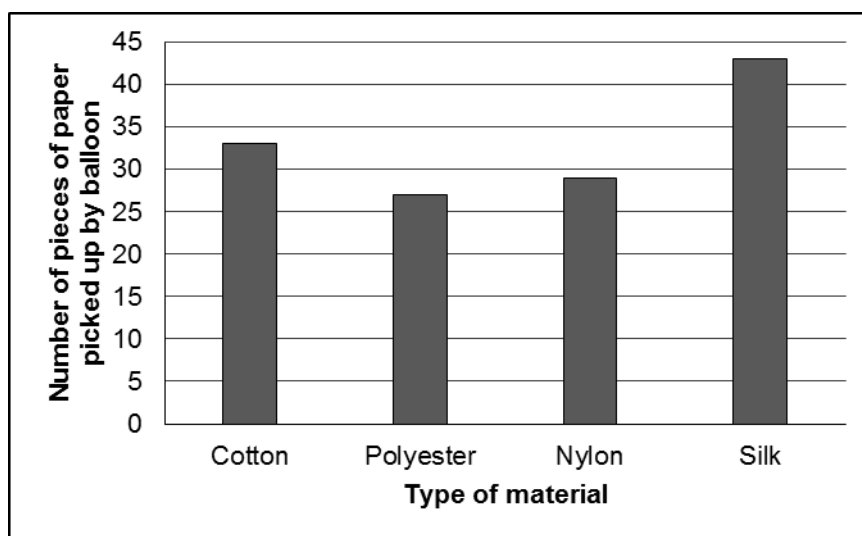


2.2.1 Identify the independent variable for this investigation. (1)

2.2.2 Identify the dependent variable for this investigation. (1)

2.2.3 To ensure that the results of the investigation are reliable, he uses the same type and size of balloon throughout the experiment. Name ONE more controlled variable. (1)

2.2.4 Theto draws the following graph to represent the results of his investigation.

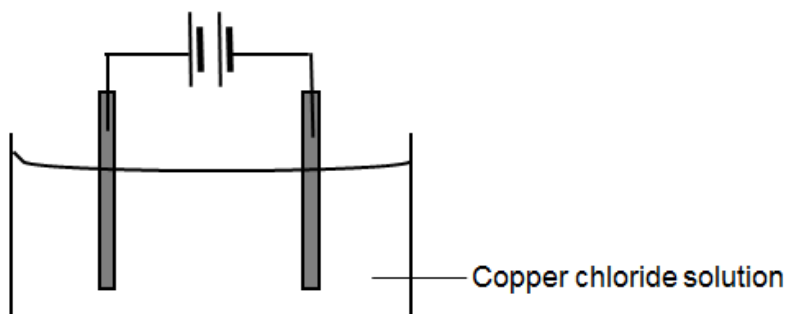


From the results, which material is the best choice for making the uniforms of petrol attendants? Explain your choice.

(2)
[7]

QUESTION 3

3.1 An electric current passes through a solution of copper chloride as shown below.

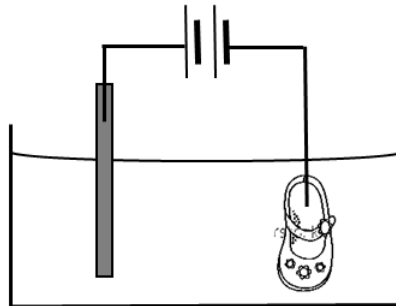


3.1.1 Write down the correct term for the process that occurs when an electric current causes a chemical reaction. (1)

3.1.2 Give the name of the electrode where chlorine gas is formed. (1)

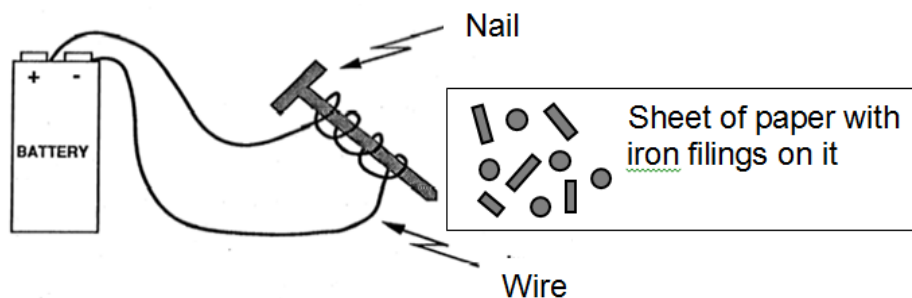
3.1.3 Name ONE observation that will indicate the formation of chlorine gas. (1)

- 3.1.4 One electrode is replaced with a baby shoe. The electric current passes through the shoe and the process continues.



Describe what happens to the shoe. (1)

- 3.2 A learner takes a piece of conducting wire and turns it around a nail. He connects the conducting wire to a battery.





- 3.2.1 Write down the correct term for the apparatus demonstrated in the sketch above. (1)

- 3.2.2 Suggest TWO changes that can be made to the apparatus for it to be able to pick up more iron filings at the same time. (2)
[7]

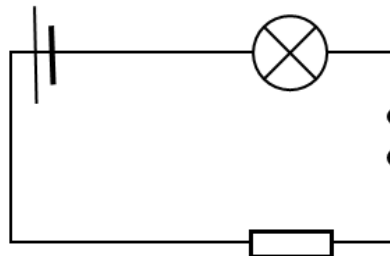
QUESTION 4

- 4.1 Complete the table below. Only write down the number (4.1.1–4.1.2) and the answer in the ANSWER BOOK.

Name of component	Symbol of component	Function of component
Switch		4.1.1
4.1.2		To convert electrical energy to sound energy

(2)

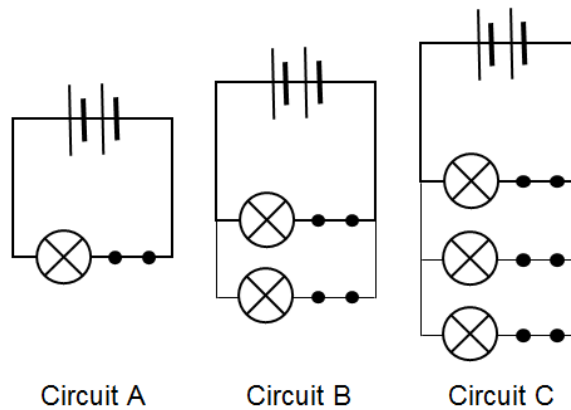
- 4.2 The following electric circuit is connected. All components are fully functional.



- 4.2.1 When the resistor is removed, the bulb glows brighter. Explain why. (2)

- 4.2.2 Use all the components in the diagram above and design a circuit where the light bulb is burning all the time, but the resistor only heats up when the switch is closed. Draw the circuit diagram in your ANSWER BOOK. (2)

4.3 Study the circuit diagrams below. All cells and bulbs are identical.

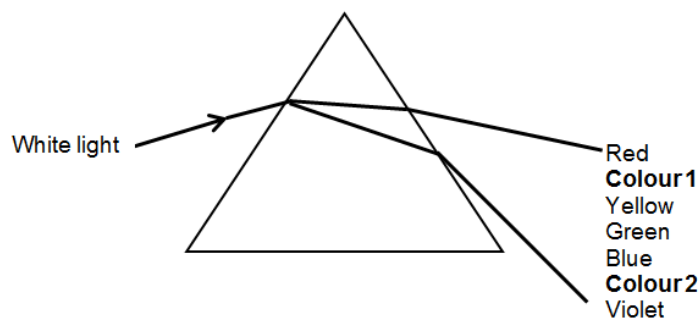


4.3.1 Compare the brightness of the bulbs in circuits **A** and **B** with each other. (1)

4.3.2 Explain why circuit **C** has the biggest overall current. (2)
[9]

QUESTION 5

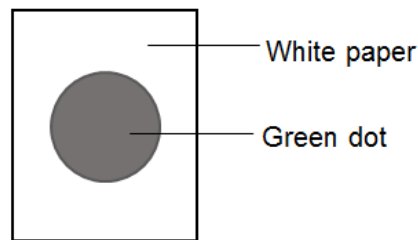
5.1 A ray of white light passes through a triangular glass prism as shown below.



5.1.1 Give the correct term for the full collection of colours that make up white light. (1)

5.1.2 Identify colours **1** and **2** in the diagram above. (2)

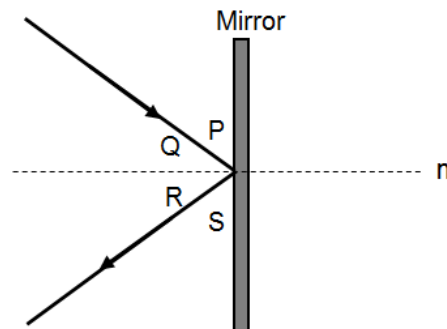
5.2 A green dot is drawn on a sheet of white paper.



5.2.1 What colour will the white paper be in red light? (1)

5.2.2 What colour will the green dot be in red light? Explain your answer. (2)

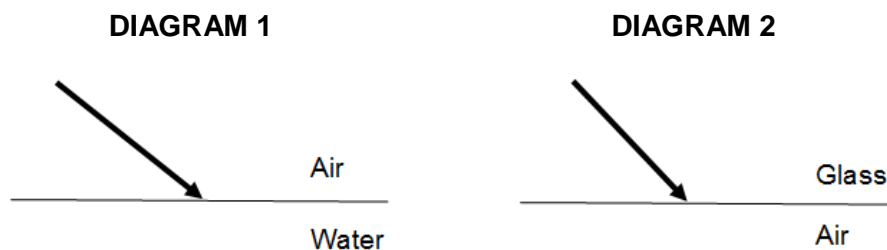
5.3 A plane mirror reflects a ray of light as illustrated below. The angle of incidence is 40° .



5.3.1 Identify the angle of incidence. Choose from **P**, **Q**, **R** or **S**. (1)

5.3.2 What is the size of the angle of reflection? (1)

5.4 In DIAGRAM A below a ray of light moves from air to water.
In DIAGRAM B a ray of light moves from glass to air.



Redraw both diagrams in your ANSWER BOOK. Complete the ray diagrams to indicate the path of the ray of light when it enters the new medium.

(2)
[10]

QUESTION 6

- 6.1 Information on the features of a few planets in our solar system is given below. The unit in which the data is measured, is indicated in brackets behind the heading of each column. Study the table and answer the questions that follow.

Planet	Distance from sun (million km)	Approximate radius of planet (km)	Time to orbit the sun (earth days)	Time to orbit its own axes (earth hours)	Average surface temperature of planet (°C)
Mars	227,9	6 792	686,97	24,6	-55
Jupiter	778,5	69 911	4 330,6	9,9	-128
Earth	149,6	6 371	365,25	24	14

- 6.1.1 Write down the names of the three planets mentioned in the table in order of INCREASING size. (3)
- 6.1.2 Write down the names of FOUR planets that are not mentioned in the table but are also found in our solar system. (4)
- 6.1.3 Write down the relationship between the average surface temperature of a planet and the distance between the planet and the Sun. (2)
- 6.1.4 Which ONE of the planets mentioned in the table has the longest year? Give a reason for your answer. (2)
- 6.1.5 Give FOUR reasons why Earth is the only planet that is able to sustain life. (4)
- 6.2 Consider the following picture of the Milky Way Galaxy.



- Why is our galaxy called the Milky Way? (1)

6.3 Write down the definition of a *light year*. (2)

6.4 Why do we use light years as a unit to measure distances in space rather than using kilometers? (2)

6.5 Label the following two diagrams:

6.5.1

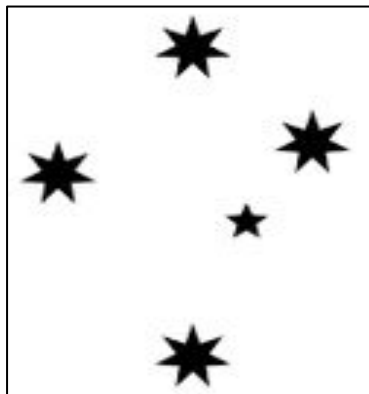


Hint:

This is an instrument used to observe objects in the night sky.

(1)

6.5.2



Hint:

This constellation can be used to find direction during night time in the Southern Hemisphere.

(1)

[22]

TOTAL SECTION B: 55
GRAND TOTAL: 70