



education

Department of
Education
FREE STATE PROVINCE

GRADE 8

NATURAL SCIENCES

NOVEMBER 2018

TIME: 1½ HOURS

MARKS: 70

This question paper consists of 12 pages.

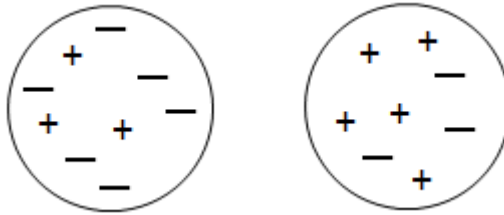
INSTRUCTIONS AND INFORMATION:

1. Write your name on the ANSWER BOOK.
2. The question paper consists of TWO SECTIONS divided into **6** questions.
3. Answer ALL questions 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, for example between QUESTION 2.1 and QUESTION 2.2.
6. You may use a non-programmable pocket calculator.
7. Show ALL steps and substitutions in ALL calculations.
8. Round off your final numerical answers to TWO decimal places where applicable.
9. Write neatly and legibly.

SECTION A**QUESTION 1**

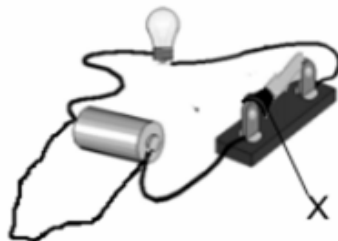
- 1.1 Four options are provided as possible answers to the following questions. Each question has only ONE correct answer. Choose the answer and write only the letter (A – D) next to the question number (1.1.1 – 1.1.10) in the ANSWER BOOK.

- 1.1.1 Study the two objects in the drawing below.



The two objects ...

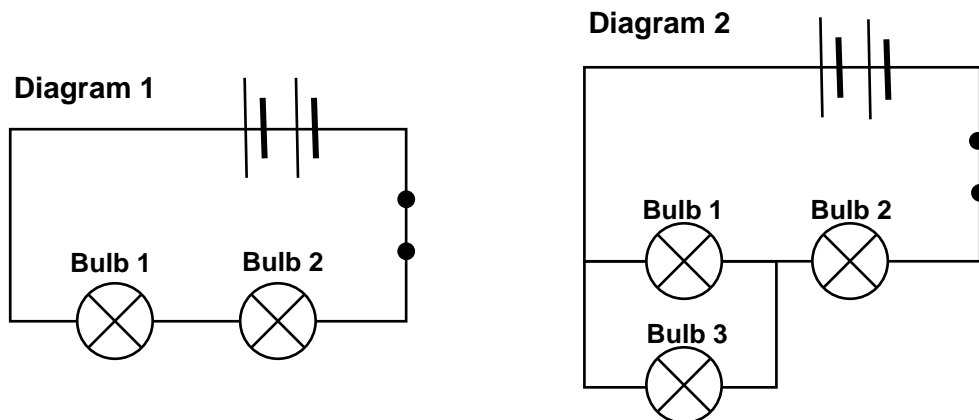
- A attract each other, because they carry unlike charges.
 - B attract each other, because they carry like charges.
 - C repel each other, because they carry unlike charges.
 - D repel each other, because they carry like charges. (1)
- 1.1.2 Which component influences the amount of electric current flowing in a circuit?
- A Cell.
 - B Closed switch.
 - C Resistor.
 - D Battery. (1)
- 1.1.3 In the diagram below, all the components are fully functional. Although switch X is closed, the bulb does not glow.



Which statement best explains why the bulb is not glowing?

- A The current in the circuit is too big.
- B It is a series circuit, instead of a parallel circuit.
- C The conducting wires heated up and no longer conduct the current.
- D The short circuit creates a path of lower resistance through which the current flows. (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**? (You can assume that the resistance of a 3 bulbs are identical) alhoewel dit nie n verskil aan die antwoord gaan maak nie

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

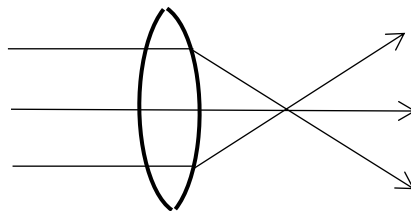
- 1.1.5 In a series circuit ...

- 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 increases as more bulbs are added.
- D bulbs can be individually switched on an off. (1)

- 1.1.6 Which statement regarding visible light is FALSE?

- A Luminous objects like the sun emits light.
- B Light can pass through opaque substances.
- C Red light has the lowest frequency of the colours of visible light.
- D Light travels at 300 000 kilometres per second through an empty space. (1)

- 1.1.7 The lens focuses the rays of light on one point due to ...



- A refraction.
- B reflection.
- C dispersion.

D absorption. (1)

1.1.8 The greatest source of energy in the Sun is ...

- A light that is given off when helium gas burns.
- B the heat that is created when hydrogen gas burns.
- C the nuclear reaction taking place when hydrogen gas changes into helium gas.
- D the heat that is given off when different gasses are compressed inside the nucleus of the Sun. (1)

1.1.9 Which planet is the FOURTH planet from the Sun?

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

1.1.10 How long does it take the Earth to orbit the Sun?

- A 24 hours
 - B 12 hours
 - C 365 $\frac{1}{4}$ days
 - D 7 days (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 If object A moves around object B, A is a ... of B.	A Moon
1.2.2 The ... constellation is found in the southern hemisphere and can be used to determine direction during night time.	B Satellite
1.2.3 Most asteroids are found in the asteroid belt between Mars and	C SALT
1.2.4 Comets move around the Sun in ... orbits.	D Jupiter
1.2.5 An optical reflective telescope that orbits Earth in outer space.	E Earth
	F Elliptical
	G Hubble
	H Circular
	I Southern Cross
	J Compass

[5]

TOTAL SECTION A: 15

SECTION B**QUESTION 2**

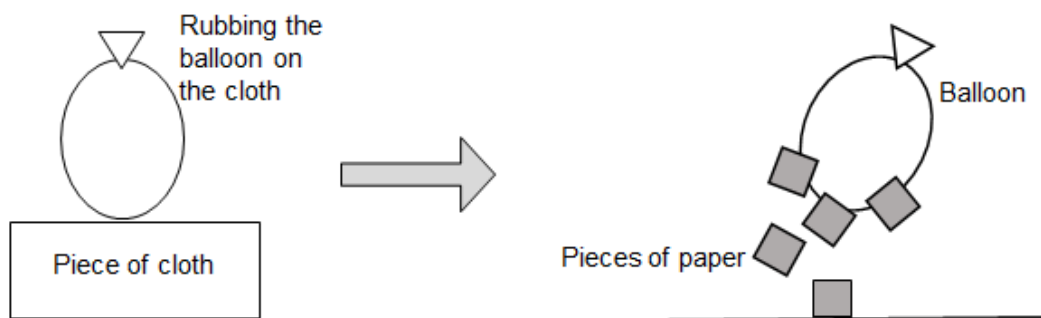
Explosions have been known to occur at petrol stations when static electricity is discharged when a person handles the nozzle to put petrol in the car.



As 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.

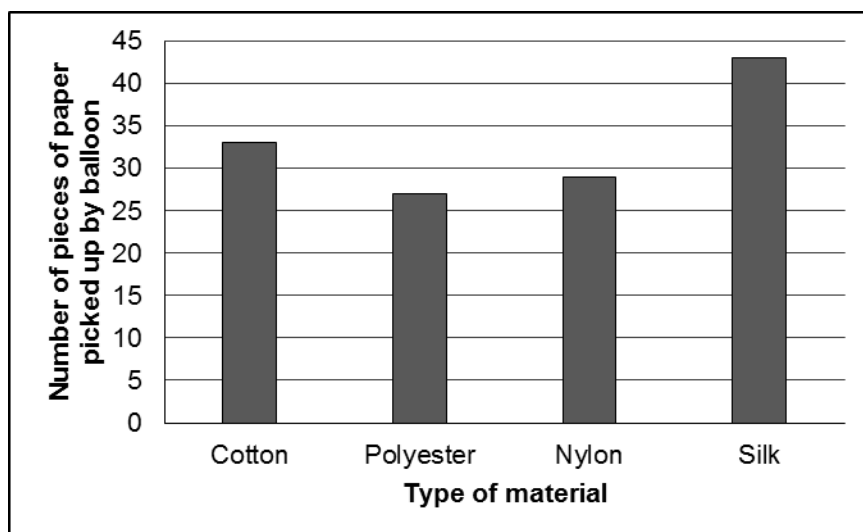
- 2.1 Explain why an electrostatic discharge can cause a fire or an explosion at a petrol station. (1)
- 2.2 Theto wonders which type of material is most suitable for making the work uniforms for petrol attendants.

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 Formulate an investigative question for Theto's investigation. (2)
- 2.2.2 Name ONE variable that must be controlled to ensure reliable results. (1)

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

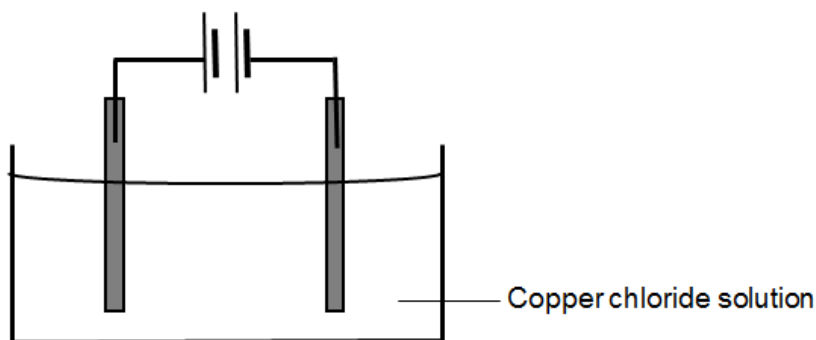


From the results, which material is the LEAST suitable and should NOT be used to make uniforms for petrol attendants? Explain your choice.

(2)
[6]

QUESTION 3

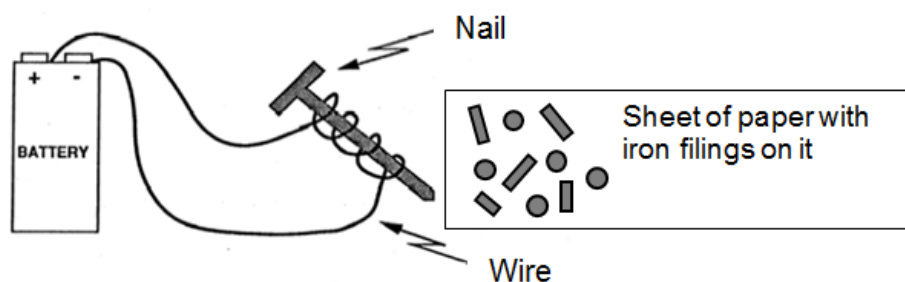
3.1 An electric current passes through a solution of copper chloride as shown below.



3.1.1 Explain what electrolysis is. (2)

3.1.2 Describe the observations that will be made at the two electrodes. (2)

- 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 What will happen to the iron filings while the current is flowing through the conducting wire? Explain how this happens. (2)

- 3.2.2 Suggest ONE change that can be made to increase the strength of the electromagnet. (1)
[7]

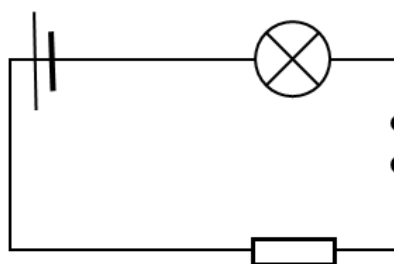
QUESTION 4

- 4.1 Complete the table below. Only write down the number and the answer.

Name of component	Symbol of component	Function of component
Cell		4.1.1
Buzzer	4.1.2	To convert electrical energy to sound energy.

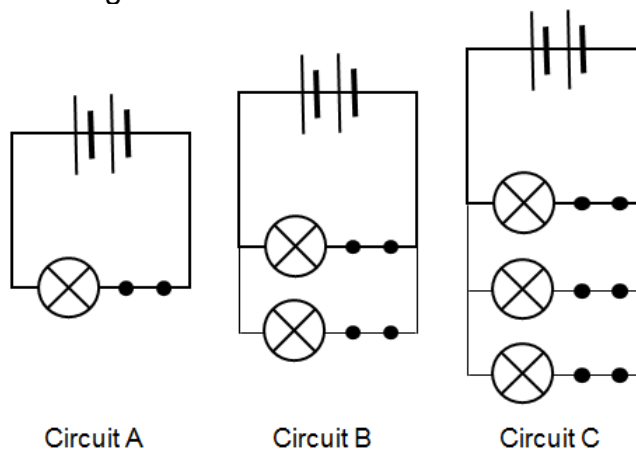
(2)

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



- What will happen to the brightness of the bulb if a second resistor is added in series to the circuit? Explain the observation. (3)

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



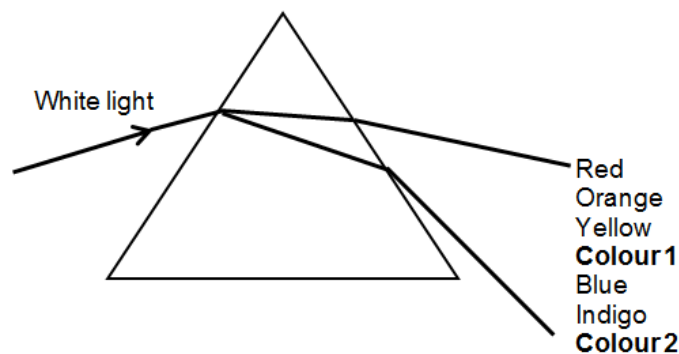
4.3.1 Compare the brightness of the bulbs in circuits A and B with each other. (1)

4.3.2 Which circuit, A, B or C, has the biggest overall current? (1)

4.3.3 Explain your answer in question 4.3.2 (2)
[9]

QUESTION 5

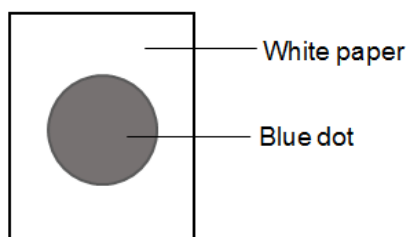
5.1 A ray of white light passes through a triangular glass prism as shown below.



5.1.1 Name the process taking place in the diagram above. (1)

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

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



5.2.1 What will the page look like in blue light? (1)

5.2.2 What will the page look like in red light? (2)

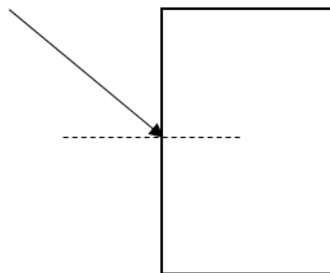
5.3 A boy is standing in front of a mirror. Behind the boy there is an apple.



5.3.1 Formulate the Law of Reflection. (1)

5.3.2 Draw a ray diagram to indicate how the boy can see the apple without turning around. (2)

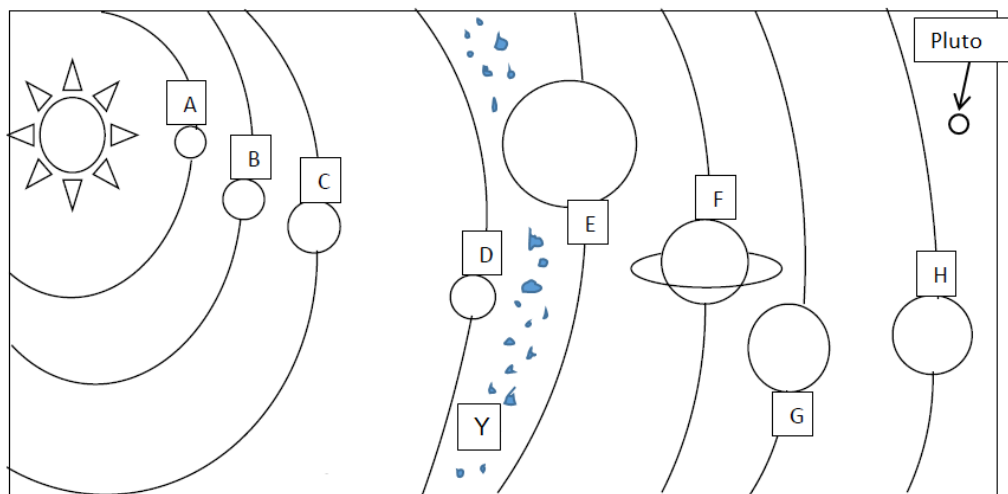
5.4 Redraw and complete the following ray diagram to indicate the path of a ray of light through a rectangular glass prism.



(2)
[11]

QUESTION 6

Consider the drawing of the solar system below and answer the questions that follow.



- 6.1 Name the celestial bodies labeled **E**, **F**, **G** and **H**. (4)
- 6.2 What keeps all the planets in our Solar system in their orbits around the Sun? (1)
- 6.3 The asteroid belt is found in the region labeled **Y**. Explain what asteroids are? (2)
- 6.4 What is the most important **difference in the composition** when the inner planets are compared to the outer planets? (2)
- 6.5 Give **FOUR** reasons why the Earth is the only planet that is able to sustain life. (4)
- 6.6 Name TWO differences between a SOLAR SYSTEM and a GALAXY. (2)
- 6.7 The diameter of our Solar System is estimated to be 13 light years.
- 6.7.1 Define a light year. (2)
- 6.7.2 One light year is equal to 10 trillion kilometers. Determine the diameter of our Solar system in kilometers. (2)
- 6.8 South Africa has many places with good conditions for observing objects in the sky through a telescope. Name THREE conditions that are needed to clearly see celestial bodies through a telescope at night. (3)

	[22]
TOTAL SECTION B:	55
GRAND TOTAL:	70