



education

Department of
Education
FREE STATE PROVINCE

GRADE 8

NATURAL SCIENCES

NOVEMBER 2015

TIME: 1½ HOURS

MARKS: 70

This question paper consists of 9 pages.

INSTRUCTIONS AND INFORMATION:

1. Write your name on the ANSWER BOOK.
2. The question paper consists of TWO SECTIONS divided into **7** 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.

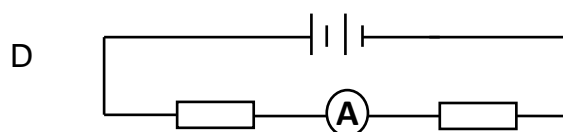
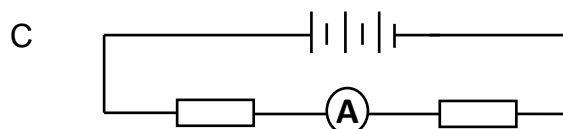
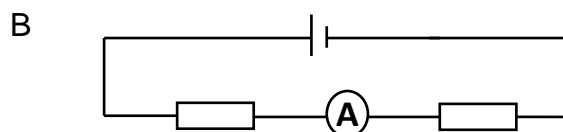
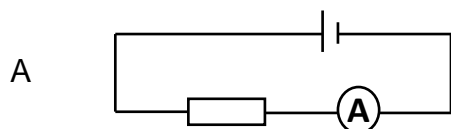
SECTION A**QUESTION 1**

Four options are provided as possible answers to the following questions. Each question has only ONE correct answer. Write only the letter (A – D) next to the question number (1.1 – 1.5 in the ANSWER BOOK.

1.1 The method of charging a balloon by rubbing it with a woollen cloth.

- A Resistance
- B Friction
- C Electrical force
- D Static electricity (2)

1.2 In which one of the following circuit diagrams will the reading on the ammeter be the largest? (All the cells and resistors in the respective circuit diagrams are identical.)



(2)

1.3. What colour does a red object display when placed under a green light? (2)

	Colour of object when placed under green light	Explanation
A	Red	A red object cannot change colour when placed under a different colour of light.
B	Purple	Purple is a mixture of red and green light.
C	Green	The green light is dominant.
D	Black	The red object absorbs the green light. No light is reflected; therefore, the object appears to be black.

- 1.4 The three planets in our Solar system closest to the Sun are ...
- A Mercury, Venus and Earth
 - B Venus, Earth and Mars
 - C Pluto, Saturn and Mars
 - D Jupiter, Venus and Earth
- (2)
- 1.5 Which of the following correctly ranks astronomical objects by size, starting with the smallest?
- A Earth, sun, solar system, galaxy, universe
 - B Sun, solar system, Earth, universe, galaxy
 - C Universe, galaxy, solar system, Earth, sun
 - D Solar system, Earth, sun, universe, galaxy
- (2)

[10]**QUESTION 2**

Write down the correct word or phrase that will complete the following sentence.
Write the answer next to the question number (2.1 – 2.5) in your ANSWER BOOK.

- 2.1 can be measured in light minutes. (1)
- 2.2 The constellation is found in the southern hemisphere and can be used to determine direction during night time. (1)
- 2.3 A is a collection of millions of stars held together by their mutual gravity. (1)
- 2.4 Electrical current can be defined as the flow of through an electrical conductor. (1)
- 2.5 The RANGE OF different colours or frequencies of white light is commonly known as the of white light. (1)

[5]**TOTAL SECTION A: 15**

SECTION B**QUESTION 3**

The picture below illustrates how Sally is able to charge a balloon **NEGATIVELY** by **RUBBING** the balloon against her hair.



- 3.1 What are the particles called which are responsible for the negative charge forming on the balloon? (1)
- 3.2 Sally's hair is attracted to the charged balloon when the balloon is brought closer to her head. Explain what is responsible for this force of attraction between the balloon and Sally's hair. (2)
- 3.3 Peter argues that a plastic ruler lying on his table is electrostatically **NEUTRAL** because it contains **NO** charges.
- 3.3.1 Is Peter's explanation **CORRECT** or **INCORRECT**? (1)
- 3.3.2 Explain your answer in question 3.3.1. (2)
- [6]**

QUESTION 4

- 4.1 Draw a circuit diagram consisting of the following components:
- a battery made up of three cells connected in series
 - two bulbs connected to one another in parallel
 - one resistor connected in series with the battery
 - an open switch connected in series with the battery and with the resistor
- (4)
- 4.2 What is the function of a resistor in an electrical circuit? (1)
- 4.3 Name the energy conversion that takes place in a battery when the switch is closed and the current flows through the circuit. (2)

- 4.4 An investigation was conducted to find out what effect the number of RESISTORS connected in SERIES has on the current strength in an electrical circuit. This investigation was conducted in order to test a hypothesis made by Bongi, a grade 8 Natural Sciences learner.

Bongi's hypothesis reads as follows. "If the number of resistors connected in series increases, then the total current in the circuit will also increase."

Method:

One cell, a switch, an ammeter and one resistor were connected in series. The switch was closed and the ammeter reading was recorded. The experiment was repeated, with two and then with three resistors connected in series. The different ammeter readings were recorded in a table.

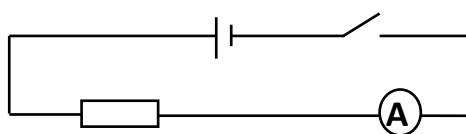


Table of results:

Number of resistors connected in series	Ammeter reading (A)
1	0,3
2	0,2
3	0,1

- 4.4.1 Write down the INDEPENDENT variable of this investigation. (1)
- 4.4.2 Write down the DEPENDENT variable of this investigation. (1)
- 4.4.3 Do the results of the investigation confirm Bongi's hypothesis? Explain your answer. (2)

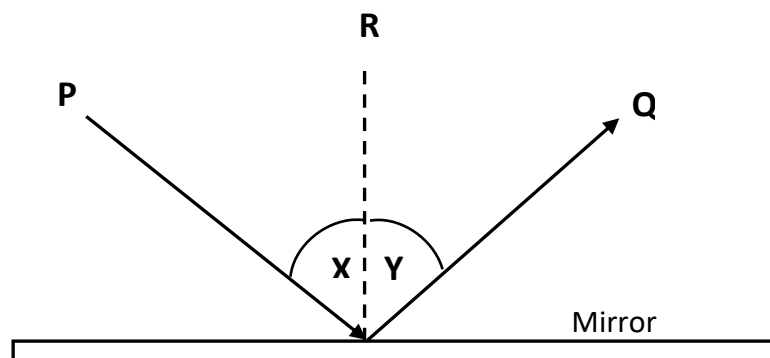
[11]

QUESTION 5

- 5.1 Make use of a labelled diagram and briefly describe how you will build an electromagnet, which is capable of picking up small metal objects. (4)
- 5.2 Name two ways in which you will be able to increase the strength of an electromagnet. (2)
- [6]**

QUESTION 6

- 6.1 Study the RAY DAIGRAM below showing the reflection of a beam of light off the surface of a mirror. Answer the questions that follow.



- 6.1.1 Provide labels for lines **P**, **Q** and **R**. (3)
- 6.1.2 Name the angles **X** and **Y**. (2)
- 6.1.3 What will happen with angle **Y** if angle **X** decreases? Explain your answer. (2)
- 6.1.4 Use your knowledge of visible light and explain why a green plant does not photosynthesise effectively when placed in green light. (2)
- [9]**

QUESTION 7

- 7.1 Study the table below with information about the different planets and answer the questions that follow.

Planets	Diameter in km	Average temperature on the surface (°C)	Atmospheric composition	Rotation period in days	Distance from the sun in AU
Mercury	4 878	-180 to 430	None	58,7	0,39
Venus	12 104	465	CO ₂ and N ₂	243	0,72
Earth	12 756	-89 to 58	N ₂ and O ₂	1	1
Mars	6 787	-82 to 0	CO ₂	1,03	1,52
Jupiter	142 800	-150	H ₂ and He	0,41	5,20
Saturn	120 000	-170	H ₂ and He	0,44	9,54
Uranus	51 118	-200	H ₂ and He	0,72	19,18
Neptune	49 528	-210	H ₂ and He	0,72	30,06

- 7.1.1 What is found at the center of our solar system? (1)
- 7.1.2 Which planet is nearest to the Sun? (1)
- 7.1.3 Which is the largest planet in our solar system? (1)
- 7.1.4 Which planet in our solar system does not have an atmosphere? (1)
- 7.1.5 What is the name of the star nearest to our Sun? (1)
- 7.1.6 How much bigger in diameter is the planet named in question 7.1.3 than the second biggest planet in our solar system? Show all calculations. (2)
- 7.1.7 Which planet has the highest surface temperature? (1)
- 7.1.8 Why is the planet, mentioned in question 7.1.7, the hottest although it is not the closest to the sun? (2)
- 7.1.9 On which planet is the length of a day almost the same as on Earth? Explain your answer. (2)
- 7.1.10 Which planet is about 1½ times further away from the Sun than Earth is? (1)

- 7.2 The position of the Earth in relation to the sun is ideal for supporting life. Explain this statement. Refer to specific conditions on Earth. (6)
- 7.3 The energy from the sun is produced during a nuclear fusion reaction.
- 7.3.1 Which substance is the fuel that is used during the nuclear fusion reaction? (1)
- 7.3.2 Which gaseous product is formed during this nuclear fusion reaction? (1)
- 7.3.3 Name two kinds of energy radiated from the sun, which we can detect with our senses. (2)
- [23]**

TOTAL SECTION B: 55

TOTAL: 70