



education

Department of  
Education  
FREE STATE PROVINCE

**GRADE 8**

**NATURAL SCIENCES**

**NOVEMBER 2016**

**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 **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**

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 A collection of stars held together by their mutual gravity.

- A Universe
- B Constellation
- C Mega group
- D Galaxy (1)

1.2 A light year is the ... light travels in one year.

- A time
- B speed
- C distance
- D direction (1)

1.3 The biggest planet in our Solar System is ...

- A Jupiter.
- B Uranus.
- C Saturn.
- D Neptune. (1)

1.4 Comets consist of (are made of) ...

- A iron.
- B ice and hydrogen gas.
- C dust, ice, rock and frozen gases.
- D small pieces of moon rock. (1)

1.5 The ... constellation can be used to find direction during night-time in the southern hemisphere.

- A Compass
- B Southern Cross
- C Orion
- D Taurus, "The Bull" (1)

- 1.6 When a negatively charged balloon is held near a neutral balloon, they attract. Which diagram explains the force of attraction between the two balloons?

	Negatively charged balloon	Neutral balloon
A		
B		
C		
D		

(1)

- 1.7 What colour does a RED OBJECT display when placed under a WHITE LIGHT?

	Colour of object when placed under white light	Explanation
A	Red	All colours are absorbed, only red is reflected by the object.
B	Red	All colours are reflected; only red light is absorbed by the object and therefore displays red.
C	White	White light is dominant.
D	White	The red object reflects white light.

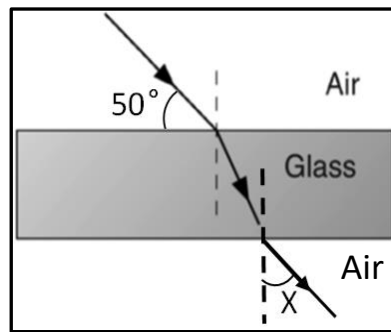
(1)

- 1.8 Different colours of light arranged in order from highest frequency to lowest frequency are as follow:

- A blue, violet, red, orange, yellow  
 B red, orange, yellow, green, blue, violet  
 C yellow, orange, red, violet, blue  
 D violet, blue, green, yellow, orange, red

(1)

1.9 The diagram below illustrates a ray of light entering glass from air.



Choose the correct statement:

- A  $X = (90^\circ + 50^\circ)$
  - B  $X = (180^\circ + 50^\circ)$
  - C  $X = 50^\circ$
  - D  $X = (90^\circ - 50^\circ)$
- (1)

1.10 A component in a circuit that melts when the current gets too high in order to protect the other components in the circuit is called a ...

- A bulb.
  - B fuse.
  - C conductor.
  - D short circuit.
- (1)  
[10]

## QUESTION 2

Use the following words or phrases to complete the sentences below:

electric charges	negatively charged	repel
positively charged	attract	spark

Friction can cause a build-up of (2.1) on the surface of an object.

When electrons are transferred to an object by rubbing it with another material it will become (2.2), and the material that loses electrons will become (2.3).

Unlike charges (2.4) and like charges (2.5) each other. [5]

**TOTAL SECTION A: 15**

**SECTION B****QUESTION 3**

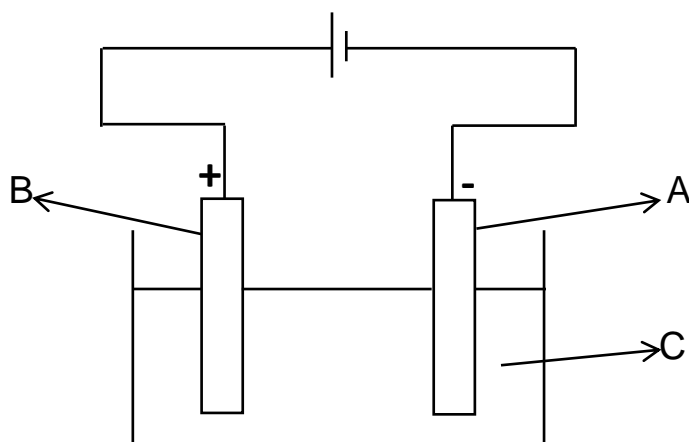
When a **glass rod** is rubbed with a **silk cloth**, the rod becomes positively charged

- 3.1 Which one of the two objects has gained electrons? (1)
- 3.2 The glass rod and the silk cloth is now slowly brought closer to one another. What will you observe? Explain your answer. (2)
- 3.3 Protons and neutrons cannot be transferred by friction. Explain why this is NOT possible. (2)
- 3.4 Draw a circuit diagram consisting of the following components:
- A battery made up of three cells connected in series.
  - A closed switch connected in series with the battery.
  - Two similar bulbs with the same resistance connected to one another in parallel.
  - Two voltmeters each connected across a bulb.
  - Indicate the direction of the conventional current. (5)
- 3.5. What will happen to the total current in the circuit if the three cells making up the battery is connected in PARALLEL with one another? Only write, **INCREASE**, **DECREASE** or **REMAINS THE SAME**. (1)
- 3.6 Name TWO advantages of connecting bulbs in parallel in an electrical circuit. (2)
- 3.7 Explain what useful energy conversion takes place in the bulbs in the circuit given in question 3.4. (2)
- 3.8 How do the readings on the two voltmeters compare with one another? Explain your answer. (2)
- 3.9 One of the bulbs burns out. How will this influence the remaining bulb? Explain your answer. (2)

**[19]**

**QUESTION 4**

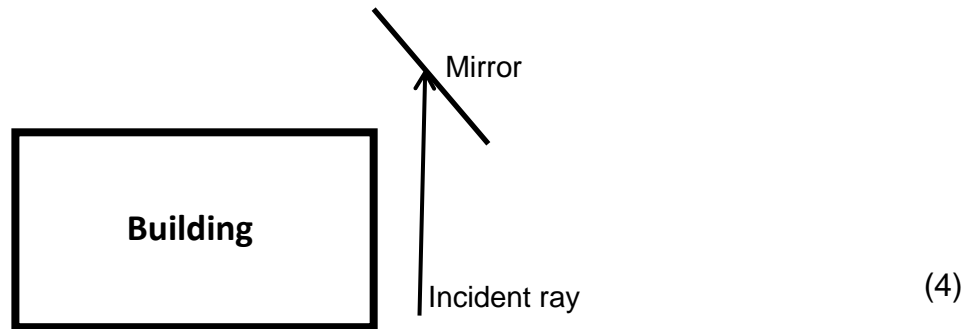
4.1 The following diagram shows the electrolysis of copper chloride.



- 4.1.1 Provide labels for the parts represented by letters **A**, **B** and **C**. (3)
- 4.1.2 What is the function of the electrical cell in the electrolysis of copper chloride? (2)
- 4.1.3 After a while, you will start to notice a build-up of a reddish brown substance on the negative electrode. Identify this substance. (1)
- 4.1.4 You will also notice bubbles forming on the positive electrode. Identify the chemical substance the bubbles are made of. (1)
- 4.1.5 Explain in your own words what happens during electrolysis. (2)
- [9]**

**QUESTION 5**

- 5.1 The mirror in the diagram below is placed in such a way that it makes it possible for a person to see around the corner of a building. Redraw the diagram in your answer book and show in your drawing the **normal (N)**, the **reflected ray**, the **angle of incidence (i)** and the **angle of reflection (r)**.



- 5.2 State the property of light that explains each of the following observations.

**Choose the answers for questions 5.2.1 to 5.2.3 from the following list of properties:**

Property of light
Absorption
Reflection
Refraction

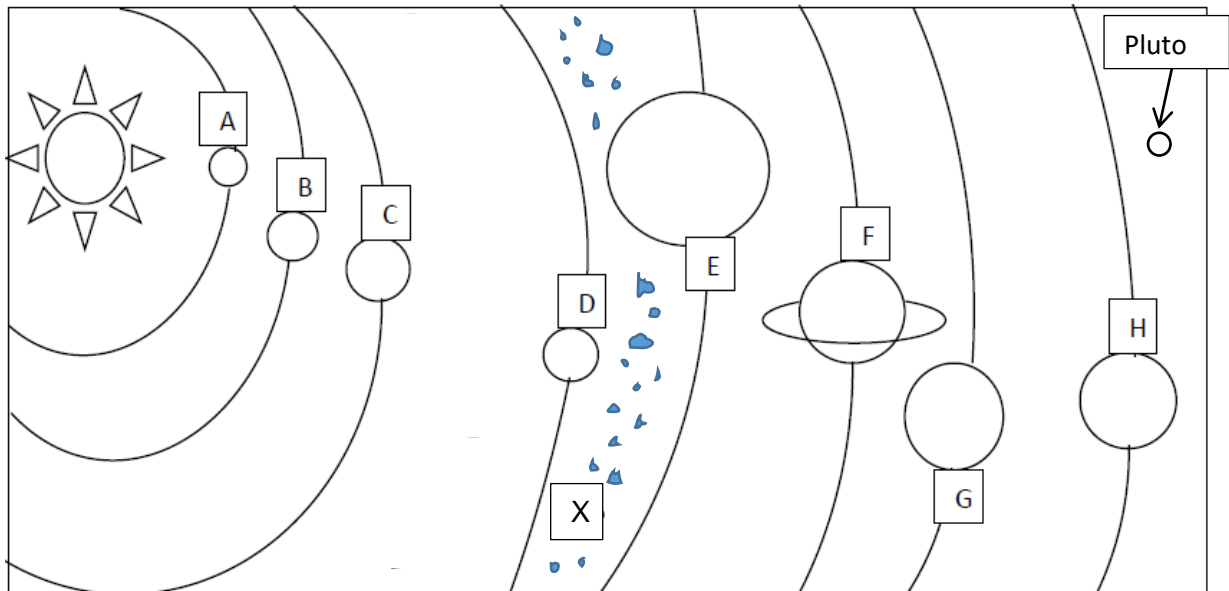
- 5.2.1 You are able to see yourself on a very smooth, polished surface. (1)
- 5.2.2 Fish in an aquarium, behind very thick glass, appear bigger than they actually are. (1)
- 5.2.3 The ink on this question paper appears to be black. (1)
- [7]**



**QUESTION 6**

6.1 What is the name of the bright star located nearest to the Sun? (1)

6.2 Look at the drawing of the solar system below and answer the questions that follow.



6.2.1 Name the celestial bodies labeled **A** to **H**. (8)

6.2.2 Pluto is no longer classified as a planet. What is it called nowadays? (1)

6.2.3 What is/are found in the region labeled **X**? (1)

6.2.4 What keeps all of these bodies in their orbits around the Sun? (1)

6.2.5 What is the major **difference in the composition** when the inner planets are compared with the outer planets? (2)

6.3 Earth is the only planet in our solar system that can support life.  
Name AND explain **THREE** conditions why Earth can support life. (6)  
**[20]**

**TOTAL SECTION B: 55**

**GRAND TOTAL: 70**