

Hillcrest High School

NATURAL SCIENCE

NOVEMBER 2023

Grade 8

MARKS: 100

EXAMINER: Miss E. Blom

Mrs L. Prior

TIME: 2 Hours

MODERATOR: Mrs M. Smith

Instructions:

1. This question paper consists of 14 pages and 2 Sections.

SECTION A: Electricity and Light (50)

SECTION B: Planet Earth and Beyond (50)

2. Answer ALL of the questions from Section A and Section B in the answer book provided.
3. Non-programmable calculators may be used.
4. Number the answers correctly according to the numbering system used in the question paper.
5. Calculations must be rounded off to two decimal places where appropriate.
6. Rule off after each question (1 – 15).

SECTION A:

QUESTION ONE – MULTIPLE CHOICE

For each of the following questions choose the correct LETTER of your choice. Write down only the **QUESTION NUMBER** and the **LETTER**. For example: 1.6 A.

- 1.1. Shadows are formed because ...
- A. all objects reflect light.
 - B. opaque objects block light.
 - C. light travels at high speeds.
 - D. objects allow light to pass through.
- 1.2. An example of a non-luminous object is ...
- A. sun
 - B. fire-fly
 - C. star
 - D. moon
- 1.3. The component in a circuit that measures the flow of electrical current is a/an ...
- A. resistor
 - B. switch
 - C. ammeter
 - D. cell
- 1.4. A leaf appears green as it ...
- A. absorbs the green frequency of light.
 - B. absorbs all frequencies of light except green light.
 - C. reflects all frequencies of light.
 - D. absorbs all frequencies of light.
- 1.5. A girl combs her hair with a plastic comb. The comb becomes negatively charged. Some of her hair moves toward the comb as she moves the comb away. Her hair has ...
- A. lost electrons.
 - B. gained electrons.
 - C. gained protons.
 - D. lost protons.
- (5)**

QUESTION TWO - TERMINOLOGY

Write down only one word/term to replace the following statements.

- 2.1. Like charges are known to have this effect.
- 2.2. Build-up of electric charge.
- 2.3. A component that opens and closes a circuit.
- 2.4. Separation of white light into seven colours when passing through a triangular glass prism.
- 2.5. A component which overheats, melts and breaks an electric circuit. **(5)**

QUESTION THREE – MATCHING COLUMNS

Match Column I with Column II. Write down the numbers 3.1 to 3.5 alongside the margin and write **ONLY** the correct **LETTER** of your choice next to it. **(5)**

COLUMN I	COLUMN II
3.1 Material that does not allow light to pass through.	A. Switch
	B. Electrolysis
3.2 Process which causes electrons to be transferred from the surface of one object to another.	C. Short circuit
	D. Clear glass
3.3 An example of an output device.	E. Friction
	F. Anode
3.4 The positive carbon electrode	G. Buzzer
	H. Clay
3.5 Electrical circuit that allows current to flow in an unintended circuit.	I. Cathode
	J. Series circuit

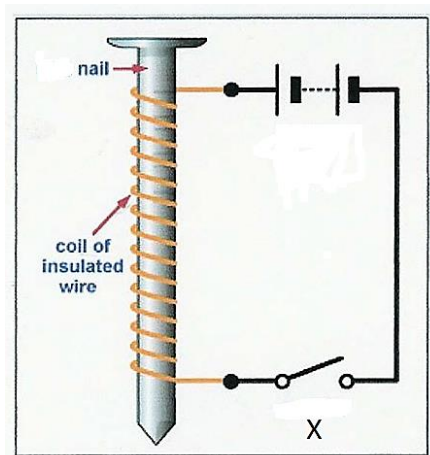
QUESTION FOUR

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

Bar magnet



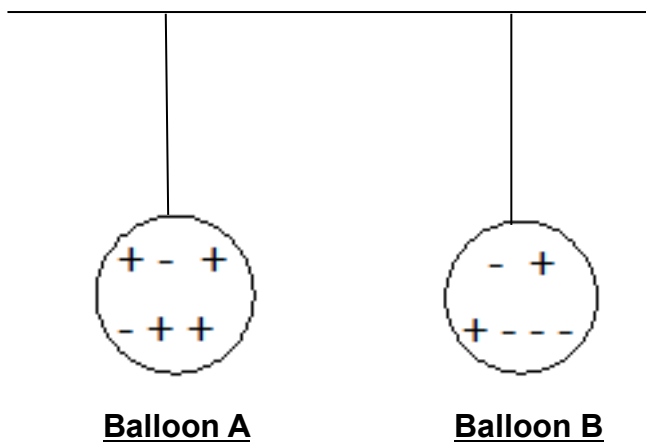
Electromagnet



- 4.1. a) Which of the two magnets is **NOT** a permanent magnet? (1)
 - b) Explain your answer. (1)
 - 4.2. Provide the label for part **X**. (1)
 - 4.3. Identify the material that the nail is made up of and suggest a reason for this. (2)
 - 4.4. Name **ONE** way in which you can increase the magnetic force of the electromagnet. (1)
- (6)**

QUESTION FIVE

Two charged balloons are hanging from a ceiling.



5.1. State the charge on:

- a) Balloon **A** (1)
 b) Balloon **B**. (1)

5.2. a) Describe what you would observe happen between the two balloons. (1)

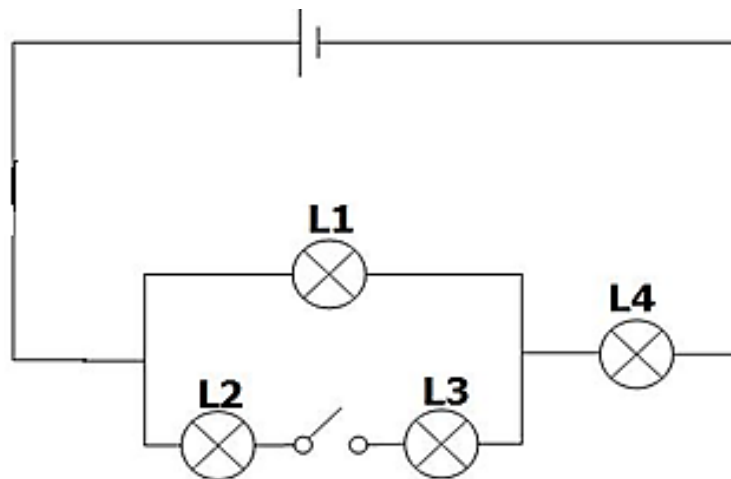
b) Explain why this happens. (1)

5.3. Name the instrument that is used to detect the presence of charges. (1)

(5)

QUESTION SIX

Study the following circuit diagram below and answer the questions that follow.



6.1. Which bulbs will glow if the switch is open? (2)

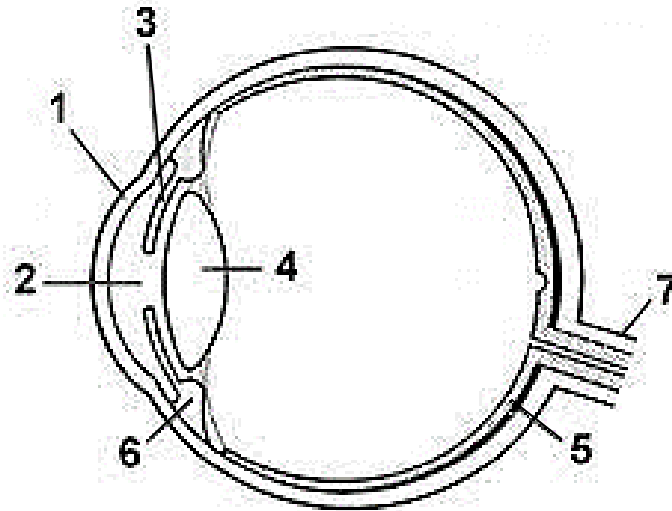
6.2. Suppose **ALL** the bulbs are identical.
 Which bulb/s will glow the brightest when the switch is closed? (1)

6.3. If **L4** burned out and was not replaced, explain what would happen to the circuit? (2)

6.4. Draw a circuit diagram that consists of 3 cells in series, 2 light bulbs in parallel and a resistor in series. Show the direction of conventional current on your diagram. (5)
(10)

QUESTION SEVEN

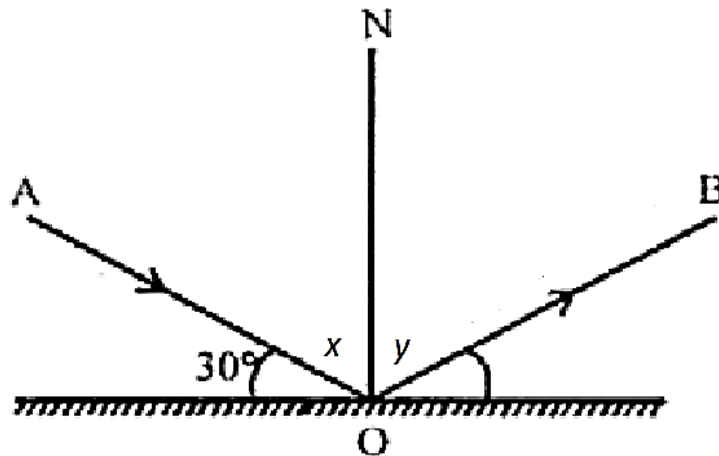
Study the diagram of the eye below and answer the questions that follow.



- 7.1. Provide the labels for parts 1 and 4. (2)
- 7.2. Provide the **NUMBER** of the part that transmits impulses to the brain. (1)
- 7.3. Explain what happens to the pupil of the eye in dim light. (1)
Does the pupil become bigger or smaller? (4)

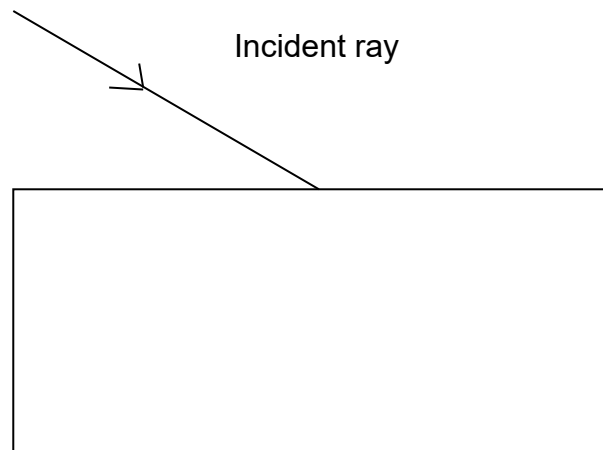
QUESTION EIGHT

Study the ray diagram showing reflection and answer the questions that follow.



- 8.1. Supply the correct scientific names for the following: (3)
 - a) OB
 - b) NO
 - c) angle y
- 8.2. Determine the value of the angle x, show ALL your working. (2)

- 8.3. Copy the following diagram into your answer booklet and complete the ray diagram. You must include the labels, arrows and a suitable heading. (5)



(10)

SECTION A : 50

SECTION B:

QUESTION NINE – MULTIPLE CHOICE

Write down the numbers 9.1 to 9.5, alongside the margin and write **ONLY** the correct letter of your choice next to it. For example, 9.6 B.

9.1. What is the largest planet in the solar system?

- A. Saturn
- B. Jupiter
- C. Venus
- D. Neptune

9.2. Earth is different from the other planets in our solar system because it...

- A. Orbits a star
- B. Has collided with meteorites
- C. Has oceans and lakes
- D. Makes up the majority of the mass of our solar system.

9.3. The invention of which instrument was most helpful to the advancement of astronomy?

- A. Microscope
- B. Telescope
- C. Camera
- D. Geiger counter

9.4. As the Earth rotates, the part of the Earth facing the sun has...

- A. Darkness (night)
- B. Winter
- C. Daylight
- D. An axis

9.5. A light year is the distance that light travels in one year at a speed of....

- A. 300 000 km per second
- B. 3 million km per second
- C. 300 000 km per hour
- D. 3 million km per hour.

(5)

QUESTION TEN – TERMINOLOGY

Write down the numbers 10.1 to 10.5 alongside the margin and write down ONLY the correct **TERM** next to it.

10.1. Explosions of gas on the surface of the Sun.

10.2. Remains of a meteoroid after it crashes onto Earth's surface.

10.3. Circular path that a body in space follows as it travels around another body.

10.4. Dents or hollows made by rocks that crash into planets or moons.

10.5. Body that revolves around a planet and that shines by reflecting the light of the Sun.

(5)

QUESTION ELEVEN – MATCHING COLUMNS

Match Column A with Column B. Write down the numbers 11.1 to 11.5 alongside the margin and write **ONLY** the correct **LETTER** of your choice next to it.

COLUMN A		COLUMN B	
11.1	Grouping of stars with a specific name	A.	galaxy
		B.	asteroid
11.2	An icy body that releases gases and dust when it gets close to the Sun	C.	meteor
		D.	solar system
11.3	A large piece of rock in space	E.	constellation
		F.	dwarf planet
11.4	A central star with planets orbiting round it	G.	moon
		H.	black hole
11.5	Body similar to a planet but that does not clear its orbital path of other bodies	I.	sunspots
		J.	comet

(5)

QUESTION TWELVE

Study the table below and answer the following questions.

Planet	Distance from the Sun (millions of km)	Revolution (one year)
Jupiter	778	12 years
Mars	228	687 days
Venus	108	225 days
Uranus	2871	84 years
Mercury	58	88 days

12.1 Name **ONE** gas giant from the table above. (1)

12.2 Write down the distance from the Sun to planet Venus. (2)

- 12.3 Write down the correct order of the planets in the table, from the closest to the Sun to the furthest away. (2)
- 12.4 The Asteroid belt is found between two of the planets in the above table. Name these two planets. (2)
- 12.5. a) What is the Kuiper belt? (1)
b) Where is the Kuiper belt found in the Solar system? (1)
- 12.6. If it takes Earth 365 days to make one revolution around the Sun, how many Earth years will it take Mars to make one revolution around the Sun?
Show all your working. (3)
- (12)**

QUESTION THIRTEEN

The table below gives information on the movements of some planets. Study the table and answer the questions that follow.

Planet	Time taken for rotation on its axis (hours)
Mars	30
Mercury	60
Jupiter	10
Uranus	20

- 13.1. Identify the independent variable. (1)
- 13.2. Using the information above, draw a **BAR GRAPH** showing the time taken for the rotation of each planet. (4)
- 13.3. Planets are held together by gravity. Briefly describe what gravity is. (1)
- 13.3. Based on your knowledge, list **THREE** factors that make Earth suitable for sustaining life. (3)
- (9)**

QUESTION FOURTEEN

Study the picture below and answer the questions that follow.



- 14.1. What is the shape of the Milky Way galaxy? (1)
 - 14.2. What is at the centre of the Milky Way galaxy? (1)
 - 14.3. List **TWO** things that the Milky Way consists of. (2)
- (4)**

QUESTION FIFTEEN

Study the pictures below and answer the questions that follow.



Diagram A



Diagram B

- 15.1. Identify the **TYPE** of telescope represented by the following:
 - a) Diagram **A** (1)
 - b) Diagram **B** (1)
- 15.2. What does the name SALT stand for? (1)

