



HILLCREST HIGH SCHOOL

Grade 8

NATURAL SCIENCE NOVEMBER 2025

MARKS: 100

EXAMINERS: Ms Thrash & Mrs Silva

TIME: 2 Hours

MODERATOR: Mrs Prior

Instructions:

1. Answer ALL the questions.
2. This question paper consists of TWO sections:
3. SECTION A – ENERGY AND CHANGE (50)
SECTION B – PLANET EARTH AND BEYOND (50)
Answer ALL sections in the ANSWER BOOK.
4. Rule off after each question.
5. Start each SECTION on a new page.
6. Non-programmable calculators may be used.
7. Appropriate mathematical instruments may be used.
8. Number the answers correctly according to the numbering system used in this question paper.
9. Calculations must be rounded off to two decimal places.

SECTION A – ENERGY AND CHANGE**QUESTION 1 : MULTIPLE CHOICE****(5 x 1 = 5)**

For each question, Q 1.1 to Q 1.5 there is only one correct answer.

Write down only the number followed by the letter (A – D) of your choice

E.g: 1.6 D

- 1.1 Which part of the eye focuses light onto the retina?
- A Cornea
 - B Iris
 - C Lens
 - D Optic nerve
- 1.2 After rubbing a plastic ruler with a cloth, a student tries to pick up small pieces of paper. The ruler only attracts them for a short while. Why?
- A The ruler is too heavy.
 - B The ruler loses its charge over time.
 - C The paper becomes heavier.
 - D The paper is not charged.
- 1.3 Which of the following correctly shows the visible light spectrum from shortest to longest wavelength?
- A Red, Orange, Yellow, Green, Blue, Indigo, Violet
 - B Violet, Indigo, Blue, Green, Yellow, Orange, Red
 - C Green, Red, Blue, Yellow, Indigo, Violet, Orange
 - D Orange, Yellow, Red, Blue, Violet, Indigo, Green
- 1.4 If white light passes through a red filter and then a green filter, what colour will come out?
- A Red
 - B Green
 - C White
 - D No light
- 1.5 If a resistor is added to a series circuit, what happens to the total resistance?
- A It decreases.
 - B It stays the same.
 - C It becomes zero.
 - D It increases.

QUESTION 2: TERMINOLOGY

(5 x 1 = 5)


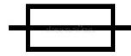
Give one **word / term** that best describes the following statements.

- 2.1 A safety device that melts and breaks the circuit when too much current flows.
- 2.2 The light sensitive layer at the back of the eye.
- 2.3 Materials that do not allow an electric current to pass through easily.
- 2.4 The spreading out of white light into its different colours.
- 2.5 A device used to detect the presence of electric charge on an object.

QUESTION 3: MATCHING COLUMNS

(4 x 1 = 4)

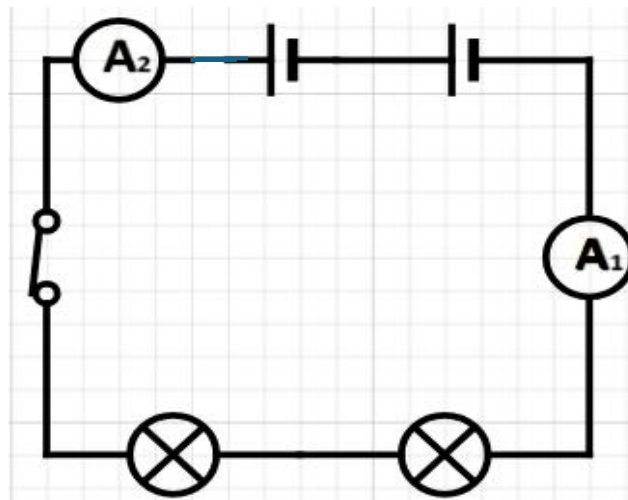
Choose the term from **COLUMN B** that best matches the description in **COLUMN A**.
Write only the letter (A– I) next to the question number (3.1 – 3.5)

3.1	Symbol that represents a resistor.	A Optic nerve
3.2	Like charges experience a...	B Force of repulsion
3.3	Sends impulses to the brain.	C Cathode
3.4	Electrode that is connected to the positive terminal in an electrolysis experiment.	D Bending of light
		E 
		F 
		G Force of attraction
		H Retina
		I Anode

QUESTION 4

(14)

Refer to the diagram below and answer the questions that follow



4.1 Identify the type of circuit. (1)

4.2 Copy and complete the flow diagram to show the energy changes that takes place in this electrical circuit. Start with the cell and end with the lightbulb.

a) _____ energy → b) _____ energy → c) _____ energy (3)

4.3 Ammeter 1 has a reading of 5A.

a) What is the reading on Ammeter 2? (1)

b) Explain your answer to 4.3 (a) (1)

4.4 A lightbulb is added in parallel to the circuit.

a) Does the overall current INCREASE, DECREASE, or STAY THE SAME? (1)

b) Explain your answer to question 4.4 (a) (2)

4.5 Draw a **circuit diagram** that consists of 2 cells in series, one lightbulb and one buzzer in parallel and an open switch that controls only the buzzer.

Show the flow of electrons in your circuit diagram (5)

The symbol for a buzzer is:

QUESTION 5

(4)

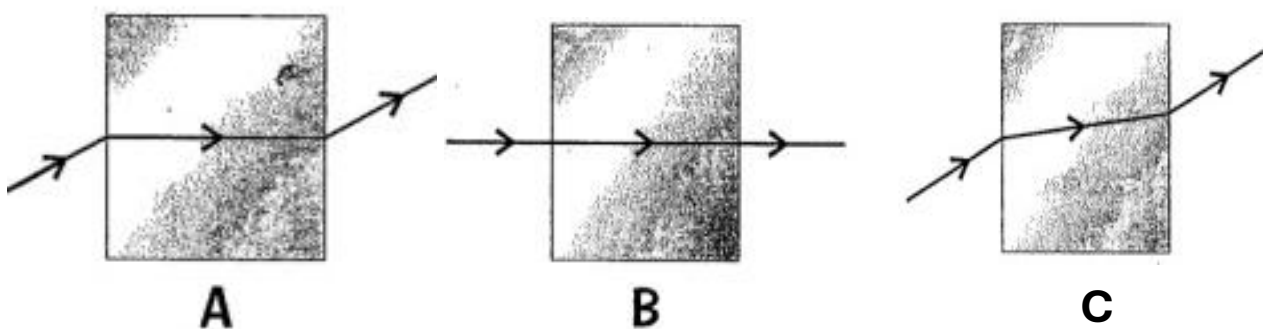
Mary rubbed a balloon with a woollen cloth, and the balloon gained a negative charge. She then placed the balloon against the wall.

- 5.1 a) What did Mary observe when she placed the balloon against the wall? (1)
 b) Explain in detail how the balloon gained the charge. (3)

QUESTION 6

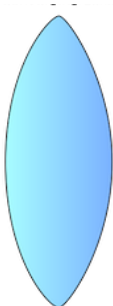
(12)

Refer to the diagram below and answer the questions that follow



- 6.1 a) Name the phenomenon being observed above. (1)
 b) Which **2** diagrams correctly represent the phenomenon? (2)
- 6.2 Draw a **fully labelled** diagram showing a ray of light being reflected with an angle of reflection equal to 60° . (5)

6.3 Refer to the lens below for the following questions.



- a) Name the type of lens in the diagram. (1)
 b) Does this lens correct near or far sightedness? (1)
 c) Redraw the lens in your answer book and show how light rays pass through the lens. (2)

QUESTION 7**(6)**

An investigation is conducted to determine which substances can conduct electricity. An electrical circuit was set up using a cell, copper connecting wires, a light bulb, crocodile clips and a switch.

Different substances are tested by placing them between the crocodile clips and closing the switch to complete the circuit.

The different substances tested are: steel wool, nichrome wire, cotton thread, rubber band and string.

The results of the experiment are provided in the table below.

SUBSTANCE TESTED	APPEARANCE OF LIGHT BULB
Steel wool	Bright
Nichrome wire	Bright
Cotton thread	No light
Rubber band	No light
String	No light

- 7.1 Write down the aim of the experiment. (1)
- 7.2 State any **2** controlled variables in this experiment (2)
- 7.3 Provide a conclusion to the investigation. (2)
- 7.4 How can you improve the investigation in terms of measuring the actual amount of current flowing in the circuit? (1)

SECTION A [50]

SECTION B : PLANET EARTH AND BEYOND**QUESTION 8 : MULTIPLE CHOICE****(5 x 1 = 5)**

For each question, Q 8.1 to Q 8.5 there is only one correct answer.

Write down only the number followed by the letter (A – D) of your choice

E.g: 8.6 D

8.1 The Kuiper Belt consists of:

- A icy and rocky objects
- B asteroids
- C ice
- D frozen gases and water

8.2 Which arrangement is correct according to size; from smallest to largest.

- A constellation, galaxy, star, universe
- B universe, galaxy, constellation, star
- C star, galaxy, constellation, universe
- D star, constellation, galaxy, universe

8.3 The largest planet is:

- A Saturn
- B Jupiter
- C Earth
- D Neptune

8.4 What is the Andromeda Spiral?

- A A planet
- B A galaxy
- C A comet
- D A constellation

8.5 The Earth orbits around the Sun every:

- A. 31 days
- B. 365 $\frac{1}{4}$ days
- C. 29 $\frac{1}{2}$ days
- D 24 days

QUESTION 9 : MATCHING COLUMNS**(4 x 1 = 4)**

Choose the term from COLUMN B that best matches the description in COLUMN A.

Write only the letter (A– H) next to the question number (9.1 – 9.4)

COLUMN A	COLUMN B
9.1 Galaxy	A Gravity B Oxygen C Nitrogen D Milky Way E Meteor F Meteoroid G Universe H Asteroid
9.2 An object's natural force that pulls other objects towards itself	
9.3 Most abundant gas in the Earth's atmosphere	
9.4 Shooting star	

QUESTION 10 : TERMINOLOGY**(5 X 1 = 5)**

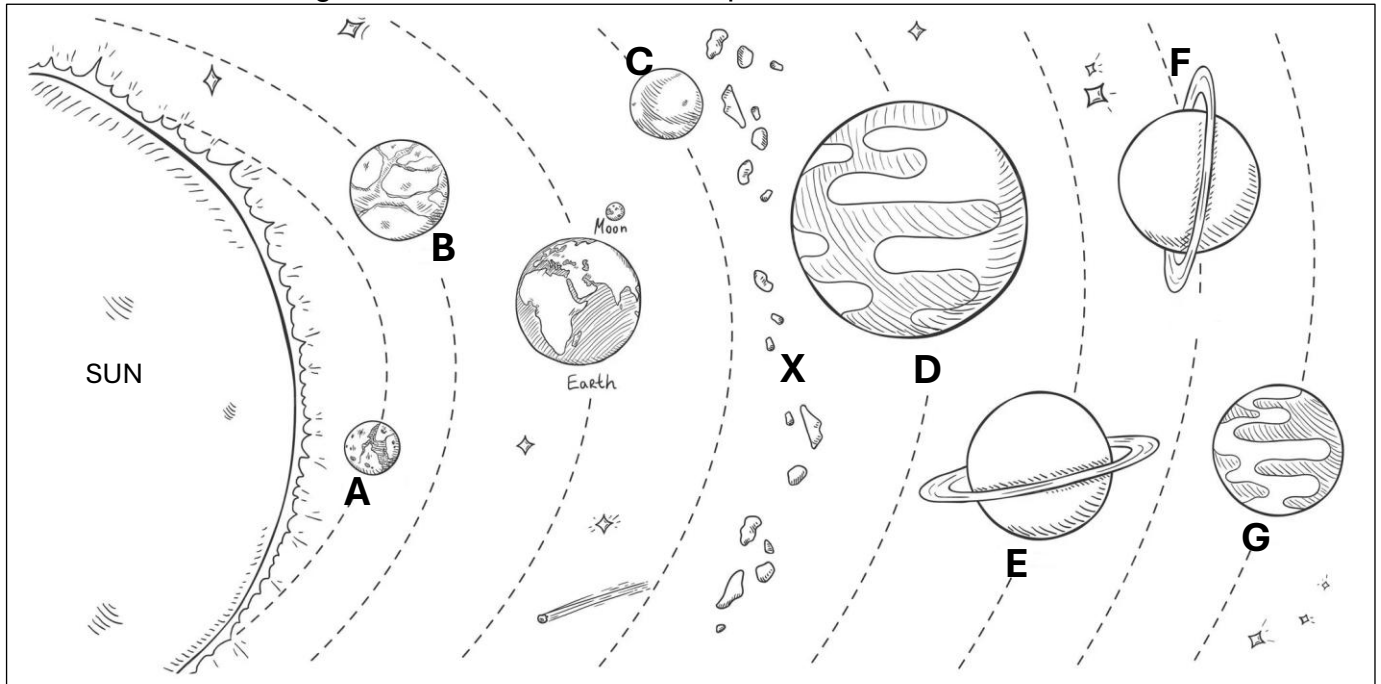
Give the correct word or term for each of the following statements.

- 10.1 Huge explosions on the Sun's surface. (1)
- 10.2 The Sun with its eight planets orbiting around it. (1)
- 10.3 Body that revolves around a planet and that shines by reflecting the light of the Sun. (1)
- 10.4 A rocky object that lands on the Earth's surface. (1)
- 10.5 The study of bodies in space. (1)

QUESTION 11:

(14)

Refer to the diagram below and answer the questions that follow.



- 11.1 Sunlight is produced through nuclear reactions where hydrogen atoms fuse together.
Name the gas that is created when hydrogen atoms undergo fusion? (1)
- 11.2 Which one of the bodies in the diagram above is a star? (1)
- 11.3 Provide the name for the area marked X. (1)
- 11.4 Refer to Planet C and answer the following questions:
 - a) Provide the name for Planet C. (1)
 - b) Is it a terrestrial planet or a gas giant? (1)
 - c) List **TWO** reasons why life is not possible on Planet C. (2)
- 11.5 Pluto is not on this diagram of the planets orbiting the sun.
What is Pluto described as and why is it not considered a planet? (2)
- 11.6 Discuss fully **THREE** conditions that support life on Earth. (3)
- 11.7 Write down the **LETTER** only that represents the planets:
 - a) Venus (1)
 - b) Uranus (1)

QUESTION 12: (8)

Refer to the table of data below and answer the questions that follow:

PLANET	Number of Moons	Avg. Temp °C	Time travel from Earth	Distance from the sun (million kms)	Day length in hours
Earth	1	15	-	149.6	24
Jupiter	67	-110	5 years	740.5	10
Mars	2	-65	8 months	206.6	25
Mercury	0	167	5 months	57.9	4222.6
Neptune	13	-200	12 years	4444.5	16
Saturn	62	-140	7 years	1352.6	17
Uranus	27	-195	10 years	2741.3	11
Venus	0	464	3 months	108.2	2802

- 12.1 Which planet has the most moons? (1)
- 12.2 Would it be quicker to travel to **Jupiter** or **Mercury**, from Earth? (1)
- 12.3 Draw a **BAR GRAPH** showing day length in hours for the 5 planets with the shortest day lengths. (5)
- 12.4 Based on the bar graph you have drawn, write down the independent variable. (1)

QUESTION 13: (4)

The diagram below shows a famous constellation of four stars and its two pointers that can easily be seen in the southern hemisphere.



- 13.1 What is the name of this constellation? (1)
- 13.2 Write down the definition of a constellation. (1)
- 13.3 One of the two pointers is the nearest star to our Sun. What is the name of this star system? (1)
- 13.4 The star system you mentioned in the question above is 4,2 light years away from our solar system. Explain what a light year is. (1)

QUESTION 14:

(10)



Read the article below and answer the questions that follow:

<p align="center">SALT and SKA take centre stage at International Astronomical Union</p> <p>Date: Aug 7, 2024 (SABC news)</p>	
<p>South Africa’s two premier astronomical tools, the Southern African Large Telescope (SALT) and the (SKA) will take centre stage at the 32nd General Assembly of the International Astronomical Union (IAU) in Cape Town.</p>	1
<p>It’s the first time the world’s foremost astronomers will meet on the African continent. The world’s astronomers meet every three years and make decisions that push science into the next gear.</p>	5
<p>Director of Astronomy for Development, Kevin Govender, says “In the 2024 IAU General Assembly, three resolutions will be voted on. The first is the protection of the dark and still night sky. The other two are slightly more technical.”</p>	
<p>The SKA, currently under construction in Carnavon in the Northern Cape and Australia, will feature prominently at the Assembly. SKA is special because it will be at least 50 times more powerful and 10 000 times faster than any other of its type in the world.</p>	10
<p>Govender adds, “On the African continent, astronomy has been growing over the past two decades or so. In South Africa, we have invested quite a bit in the field starting with the Southern African larger telescope and more recently the Karoo array telescope or Meerkat, which has produced some of the best images in the world in terms of radio astronomy. These projects are world-renowned.”</p>	15
<p>SALT continues to amaze with the discoveries of black holes and polar stars.</p>	

- 14.1 What does SKA stand for? (1)
- 14.2 Mention **ONE** way that SKA will be superior to any other of its type in the world. (1)
- 14.3 The article mentions that it is important to have **both** a “dark and still night sky” (line 9) for the telescopes. When using telescopes explain why these **two factors** are important. (2)

14.4 Complete the following table by choosing words from the box below.
 Write down **ONLY** letters (A – F) in your answer booklet and then **ONLY** the correct word next to each letter.
 DO NOT REDRAW the table. (6)

Hubble Space Telescope	SALT
lenses / mirrors	metal dish
KAT-7	Optical
sound	Radio

	
A) TYPE of telescope _____	B) TYPE of telescope _____
C) Makes use of _____	D) Makes use of _____
E) Example in South Africa _____	F) Example shown in diagram _____

SECTION B: [50]

GRAND TOTAL: [100]

