Hillcrest High School

Grade 8

NATURAL SCIENCE

JUNE 2023

MARKS: 100

TIME: 2 Hours

EXAMINER: Miss E. Blom
Mrs L.Prior

MODERATOR: Mrs M. Smith

Instructions:

1. This question paper consists of 13 pages and 2 Sections.
   SECTION A: Life Science (50)
   SECTION B: Physical Science (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 – 14).

SECTION A:

QUESTION ONE

For each of the following questions choose the correct LETTER of your choice. Write down only the **QUESTION NUMBER** and the **LETTER**. For example; 1.7 A.

1.1. In a test for starch in a green leaf…
- A. Iodine turns blue/black
- B. Lime water remains clear
- C. Clear lime water turns milky white
- D. Milky lime water turns clear

1.2. The micro-organism that makes bread rise is…
- A. Mould
- B. Yeast
- C. Cocci
- D. Protists

1.3. Plants that are adapted to living in hot, dry climates are called…
- A. Mesophytes
- B. Xerophytes
- C. Hydrophytes
- D. Halophytes

1.4. Which of the following is **NOT** a human factor that disrupts ecosystems?
- A. Poaching
- B. Monoculture
- C. Pollution
- D. Heat-waves

1.5. Decomposition by bacteria is the process that…
- A. Releases nutrients back into the soil
- B. Absorbs nutrients back into an organisms
- C. Creates penicillin
- D. Collects organisms

1.6. Animals that feed on plant matter only are called…
- A. Scavengers
- B. Herbivores
- C. Producers
- D. Omnivores **(6)**

QUESTION TWO

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

2.1. The total variety of species in an area.

2.2. Energy in the form of light and heat.

2.3. Chemicals or wastes that contaminate the water, air or soil.

2.4. All of the non-living things in an ecosystem. **(4)**

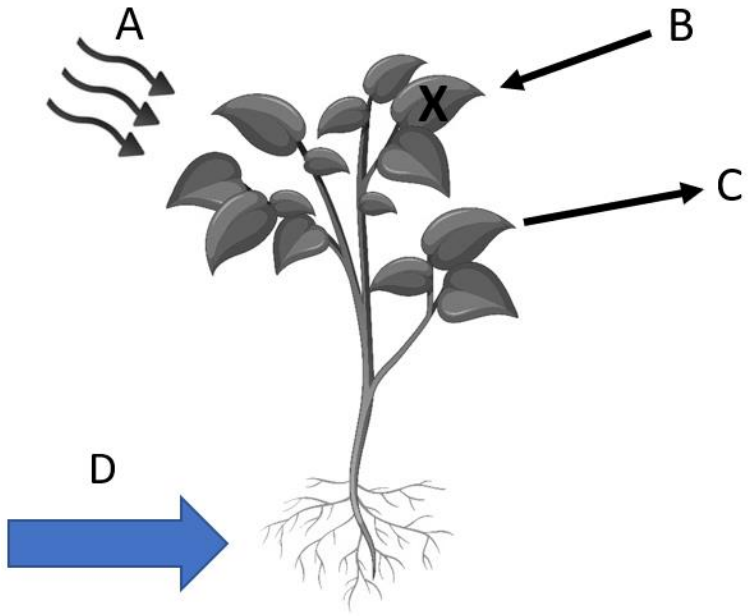
QUESTION THREE

Match Column I with Column II. Write down the numbers 3.1 to 3.6 alongside the margin and write **ONLY** the correct **LETTER** of your choice next to it**.** **(6)**

COLUMN I	COLUMN II
3.1. Medicines that treat bacterial infections.	A. Potential Energy
3.2. Group of individuals of the same species living in the same ecosystem at the same time.	B. Predator
3.3. Energy that is stored in an object or system.	C. Viruses
3.4. Carnivore that hunts other animals.	D. Respiration
3.5. Micro-organisms that cannot be placed into one of the five kingdoms.	E. Population
3.6. The process in cells where sugars are broken down and energy is released.	F. Decomposition
	G. Protists
	H. Ecosystem
	I. Antibiotics
	J. Kinetic Energy

QUESTION FOUR

Study the diagram below and answer the questions that follow.



4.1 Name the process that takes place at the part labelled **X**. (1)

4.2 Provide the **LETTERS** (A - D) and the **NAMES** of the two gases that are involved in the process named in question 4.1. (4)

4.3 What is the name of the pigment that plays a role in this process? (1)

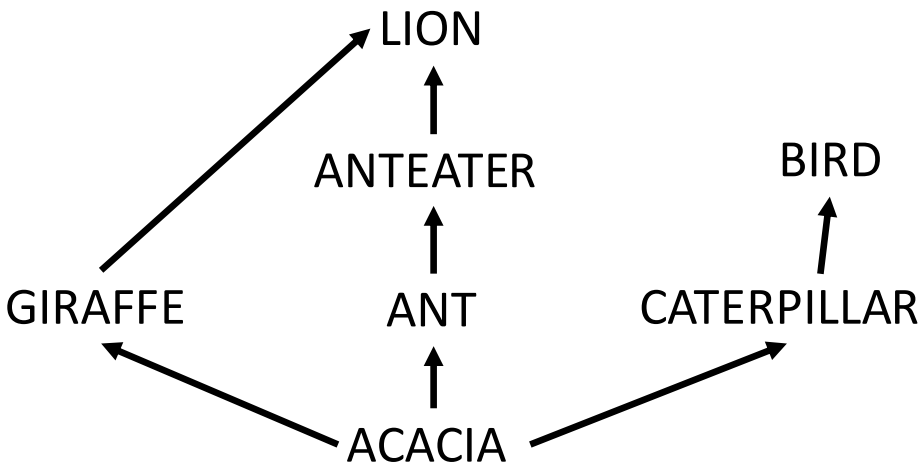
4.4 The process produces glucose.

Provide **TWO** chemical compounds that plants can convert glucose into. (2)

(8)

QUESTION FIVE

Study the diagram of a grassland ecosystem and then answer the questions that follow.



5.1 Provide the name of the diagram above. (1)

5.2 Identify the producer. (1)

5.3 What do the arrows in the diagram above represent? (1)

5.4 Draw and label an energy pyramid for a food chain, taken from the diagram above, consisting of **FOUR** organisms. (5)

5.4 Explain what happens to the amount of energy available at each trophic level. (2)

(10)

QUESTION SIX

Study the diagrams below and answer the questions that follow.

Diagram A

Diagram B

6.1 Name the type of behaviour displayed by the organism in **Diagram B**. (1)

6.2 Explain the advantage of this type of behaviour. (2)

6.3 Name the type of habitat the organism in **Diagram A** is adapted to living in. (1)

6.4 List any **TWO** adaptations of the organism in **Diagram A** which enables it to live in the habitat named in question 6.3. (2)

(6)

QUESTION SEVEN

Study the statistics of an outbreak of E. coli in South Africa in 2011 and answer the questions that follow.

Province	Total Number of Cases
Eastern Cape	65
Free State	15
Gauteng	140
KwaZulu-Natal	100
Limpopo	5
Mpumalanga	40
Northern Cape	5
North West	20
Western Cape	110

7.1 Which province had the most cases of E. coli during 2011? (1)

7.2 Calculate the total number of cases recorded in 2011. Show ALL working. (2)

7.3 Draw a **BAR GRAPH** showing the total cases recorded in Eastern Cape, Gauteng, Mpumalanga and Western Cape. (5)

7.4 The micro-organism that causes E. coli is a water-borne bacterium. Explain how you can prevent water-borne illnesses from spreading. (2)

(10)

SECTION A : 50

SECTION B:

QUESTION 8

For each of the following questions choose the correct LETTER of your choice. Write down only the **QUESTION NUMBER** and the **LETTER**. For example; 8.6. A.

8.1. Which of the following is a mixture?

A. Carbon dioxide
B. Salt crystals
C. Air
D. Water

8.2. Which of the following is a diatomic molecule?

A. CH_4
B. F_2
C. NH_3
D. O_3

8.3. Matter is anything …

A. that has a mass.
B. that we can see and smell.
C. that we can touch and see.
D. that has mass and occupies space.

8.4. Electrons are …

A. negatively charged particles.
B. neutral particles.
C. found in the nucleus.
D. Positively charged particles.

8.5. The element found in Period 3, Group 16 on the Periodic Table.

A. Oxygen
B. Silicon
C. Sulfur
D. Sodium **(5)**

QUESTION 9

Match the definitions in Column I with the correct term in Column II.

Write down only the number and the letter of your answer. E.g. 9.6. R (5)

	COLUMN I	COLUMN II
9.1	A substance made of only one element or only one compound.	A. Right B. Antoine Lavoisier C. Pure substance D. Gas E. Left F. Dmitri Mendeleev G. Carbon H. Liquid I. Impure substance J. Solid K. Mercury
9.2	The elements on the Periodic Table were arranged by.	
9.3	Phase of matter that is held together by very strong forces of attraction between them.	
9.4	A non-metal.	
9.5	The side of the Periodic Table where most metals occur.	

QUESTION 10

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

10.1. Central part of the atom that contains protons and neutrons.

10.2. The vertical rows of the Periodic Table.

10.3. Elements that have properties of both metals and non-metals.

10.4. Changing from a solid state to a liquid state when heated.

10.5. Particles moving form a high concentration to a low concentration. **(5)**

QUESTION 11

11.1. Write down the chemical symbol for the following elements.

11.1.1. Magnesium

11.1.2. Carbon

11.1.3. Neon (3)

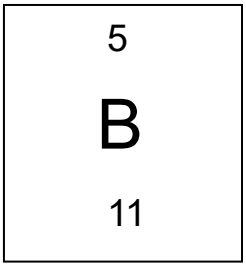
11.2. Write down the name of the following elements.

11.2.1. Al

11.2.2. Cl

11.2.3. K (3)

11.3. Study the diagram of the element Boron and answer the following questions.



11.3.1. Write down the mass number for the element Boron. (1)

11.3.2. How many protons does an atom of Boron have? (1)

11.3.3. Calculate the number neutrons an atom of the element Boron has.

Show all your working. (2)

(10)

QUESTION 12

Sulphuric acid (H_2SO_4) was used in a Grade 8 experiment in the laboratory.
Study its chemical formula below and answer the questions.

$$H_2SO_4$$

12.1. Redraw the table below into your answer booklet and complete the missing information. (6)

Element name	Number of atoms

12.2. Calculate the total number of atoms in Sulphuric acid.

Show all your working. (2)

(8)

QUESTION 13

Consider the three phases of matter as shown in the diagram below.

A **B** **C**

13.1. Write down the **LETTER** of the diagram that represents a liquid. (1)

13.2. Name and describe the change of phase from **B** to **C**. (2)

13.3. List any **THREE** properties of the particles shown in **diagram C**. (3)

(6)

QUESTION 14

Using the formula D= $\frac{M}{V}$, calculate the following.

(Round off all your answers to 2 decimal places.)

14.1. Calculate the density of a wooden block that has a mass of 0,92g and a volume of 0,55cm^3. (3)

14.2. The table below shows the densities of some substances found in everyday life. Study the table below and answer the questions that follow.

Substance	Density (g/cm^3)
Copper	9.00
Gold	19.00
Cooking oil	0.93
Quartz	3.00
Water	1.00

14.2.1. If quartz is placed into water will it float? (yes or no). (1)

14.2.2. Give a reason for your answer. (1)

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14.2.3. If 25 cm^3 of oil was placed into a measuring cylinder, calculate the mass of the oil. (3)

14.2.4. Identify the dependent variable. (1)

14.2.5. Write down a suitable conclusion for the data collected in the table above. (2)

(11)

SECTION B: 50

Physical Sciences/P2

2
NSC

TABLE 3: THE PERIODIC TABLE OF ELEMENTS
TABEL 3: DIE PERIODIEKE TABEL VAN ELEMENTE

1 (I)	2 (II)	3	4	5	6	7	8	9	10	11	12	13 (III)	14 (IV)	15 (V)	16 (VI)	17 (VII)	18 (VIII)
2,1 1 H 1																	2 He 4
1,0 3 Li 7	1,5 4 Be 9											2,0 5 B 11	2,5 6 C 12	3,0 7 N 14	3,5 8 O 16	4,0 9 F 19	10 Ne 20
0,9 11 Na 23	1,2 12 Mg 24											1,5 13 Aℓ 27	1,8 14 Si 28	2,1 15 P 31	2,5 16 S 32	3,0 17 Cℓ 35,5	18 Ar 40
0,8 19 K 39	1,0 20 Ca 40	1,3 21 Sc 45	1,5 22 Ti 48	1,6 23 V 51	1,6 24 Cr 52	1,5 25 Mn 55	1,8 26 Fe 56	1,8 27 Co 59	1,8 28 Ni 59	1,9 29 Cu 63,5	1,6 30 Zn 65	1,6 31 Ga 70	1,8 32 Ge 73	2,0 33 As 75	2,4 34 Se 79	2,8 35 Br 80	36 Kr 84
0,8 37 Rb 86	1,0 38 Sr 88	1,2 39 Y 89	1,4 40 Zr 91	1,6 41 Nb 92	1,8 42 Mo 96	1,9 43 Tc	2,2 44 Ru 101	2,2 45 Rh 103	2,2 46 Pd 106	1,9 47 Ag 108	1,7 48 Cd 112	1,7 49 In 115	1,8 50 Sn 119	1,9 51 Sb 122	2,1 52 Te 128	2,5 53 I 127	54 Xe 131
0,7 55 Cs 133	0,9 56 Ba 137	57 La 139	1,6 72 Hf 179	73 Ta 181	74 W 184	75 Re 186	76 Os 190	77 Ir 192	78 Pt 195	79 Au 197	80 Hg 201	1,8 81 Tℓ 204	1,8 82 Pb 207	1,9 83 Bi 209	2,0 84 Po	2,5 85 At	86 Rn
0,7 87 Fr	0,9 88 Ra 226	89 Ac															

58 Ce 140	59 Pr 141	60 Nd 144	61 Pm	62 Sm 150	63 Eu 152	64 Gd 157	65 Tb 159	66 Dy 163	67 Ho 165	68 Er 167	69 Tm 169	70 Yb 173	71 Lu 175
90 Th 232	91 Pa	92 U 238	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

KEY/*SLEUTEL*

Atomic number *Atoomgetal*

Electronegativity *Elektronegatiwiteit*

Symbol *Simbool*

29
1,9 Cu
63,5

Approximate relative atomic mass *Benaderde relatiewe atoommassa*