



education

Department of
Education
FREE STATE PROVINCE

GRADE 8

NATURAL SCIENCES

JUNE 2024

TIME: 1 HOUR

MARKS: 50

This question paper consists of 9 pages and a PERIODIC TABLE on page 9.

INSTRUCTIONS:

1. The question paper consists of TWO SECTIONS:
SECTION A – One question (Question 1)
SECTION B – Seven questions (Question 2 to 8)
2. Answer ALL the questions.
3. Number all the answers in your answer book exactly as the questions are numbered in the question paper.
4. Write neatly and legibly.
5. A Periodic Table is provided on page 9 of this question paper.

SECTION A**QUESTION 1**

- 1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A – D) next to the question number (1.1.1 – 1.1.5) in the ANSWER BOOK, e.g. 1.1.6 D.
 - 1.1.1 The following particles are found in the nucleus of an atom:

A	Neutrons and electrons.	
B	Neutrons, elements, and electrons.	
C	Protons and neutrons	
D	Protons, electrons, and neutrons.	(1)
 - 1.1.2 Which one of the following is NOT an example of a compound?

A	H ₂ O	
B	O ₂	
C	CuCl ₂	
D	CO ₂	(1)
 - 1.1.3 Melting is the change in state of a ...

A	liquid to a solid.	
B	liquid to a gas.	
C	solid to a gas.	
D	solid to a liquid.	(1)

1.1.4 What happens to the density of a substance if its volume increases while its mass remains constant?

- A Density increases.
- B Density decreases.
- C Density remains the same.
- D Density becomes zero.

(1)

1.1.5 The reactants in a chemical reaction are ...

- A the new substances that are formed.
- B all the substances that appear in the solid phase.
- C all the substances that are involved.
- D all the substances that react with each other.

(1)

[5]

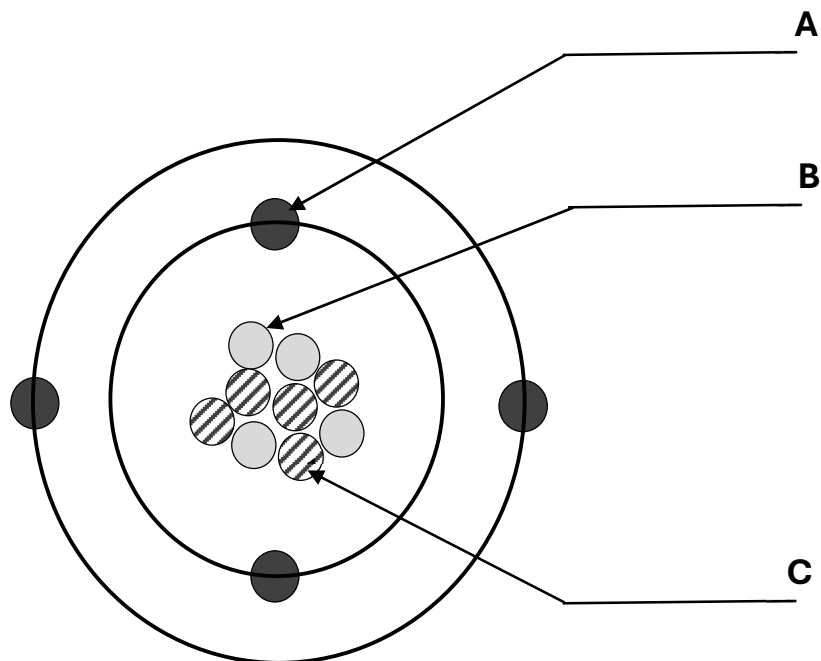
1.2 Choose the item from COLUMN B that matches the description in COLUMN A. Write only the letter (A – G) next to the question number (1.2.1 – 1.2.5) in the ANSWER BOOK.

COLUMN A		COLUMN B	
1.2.1	Phase change from a liquid to a solid state.	A	Property of a gas
1.2.2	The amount of space occupied by a substance.	B	Pressure
1.2.3	Particles move from high to low concentration.	C	Volume
1.2.4	Particles slide past each other.	D	Freezing
1.2.5	Caused by the collisions of gas particles with each other and with the sides of the container.	E	Property of a liquid
		F	Condensation
		G	Diffusion

[5]**TOTAL SECTION A: 10**

SECTION B**QUESTION 2**

The diagram below represents the structure of an atom that is **NEUTRAL**.

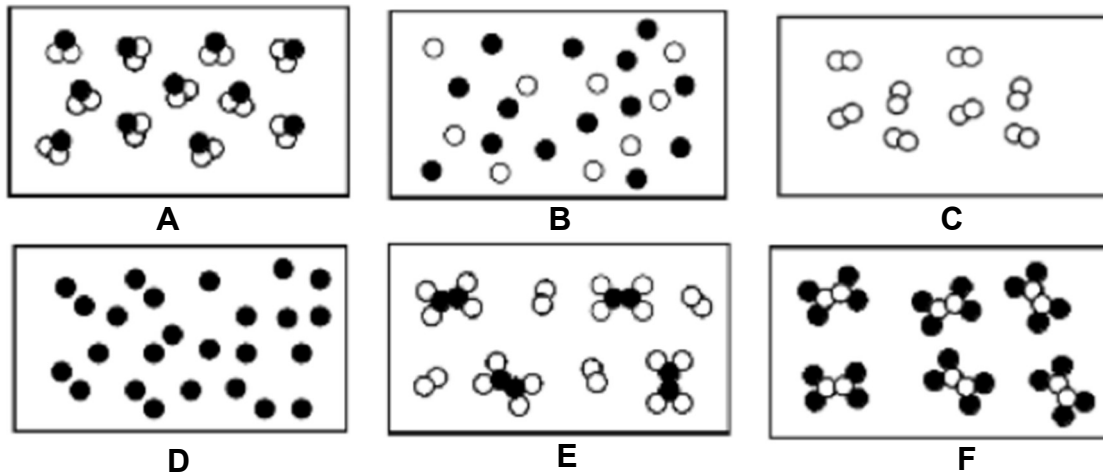


- 2.1 Name the three sub-atomic particles labelled A, B and C in the above diagram. (3)
- 2.2 Which ONE of the particles you named in 2.1 is negatively charged? (1)
- 2.3 Explain why the above atom is regarded as neutral. (1)
- [5]**

QUESTION 3

- 3.1 Use the Periodic table of elements provided at the end of this paper to answer the following questions:
- 3.1.1 The element **Ca** is a metal and is found on the periodic table of elements. What is the chemical NAME of this element? (1)
- 3.1.2 Write down the chemical SYMBOL for the element magnesium. (1)
- 3.1.3 Give a definition of an element. (1)

3.2 The following diagrams represent elements, compounds, and mixtures.

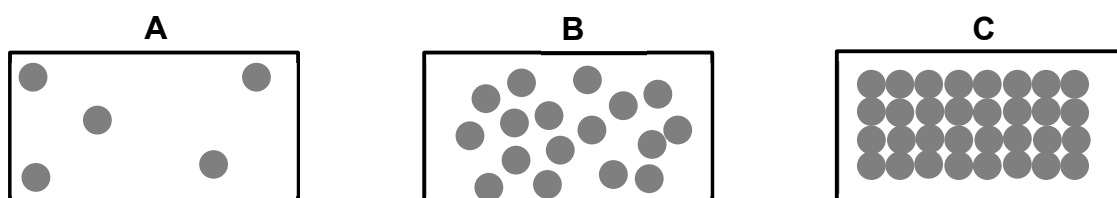


Consider the above diagrams and identify each of the following (ONLY write down A, B, C, D, E or F).

- | | |
|---|------------|
| 3.2.1 An element. | (1) |
| 3.2.2 A compound. | (1) |
| 3.2.3 A mixture. | (1) |
| 3.2.4 A diatomic element. | (1) |
| 3.2.5 Which diagram is most likely to represent water (H_2O)? | (1) |
| | [8] |

QUESTION 4

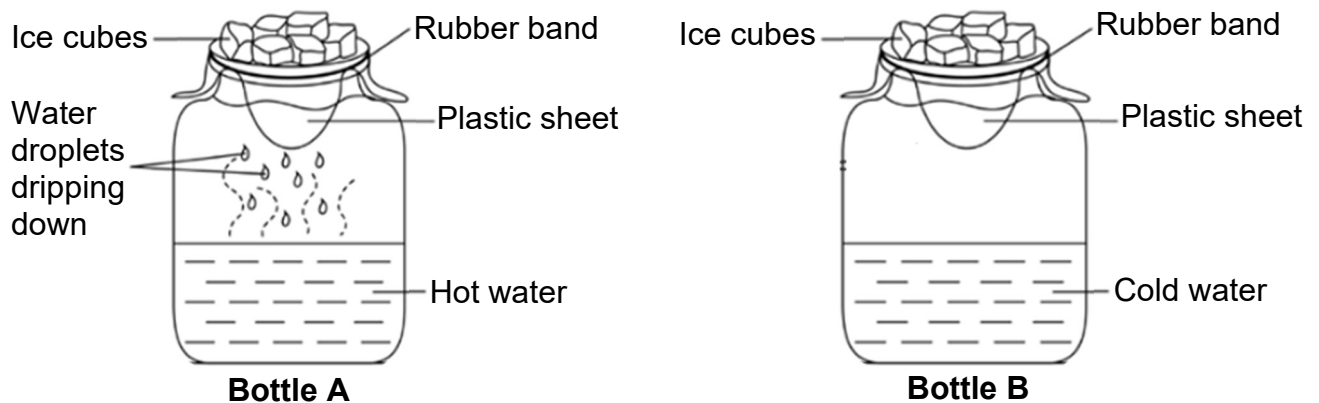
The diagrams shown below illustrate the particle arrangement in different states of matter.



- | | |
|---|------------|
| 4.1 Which of the diagrams represent a liquid? Only write A, B or C. | (1) |
| 4.2 Give one difference between a gas and a solid. | (1) |
| 4.3 Describe what will happen if a solid substance is heated? | (1) |
| 4.4 What do we call the process when a liquid changes to a gas? | (1) |
| 4.5 Explain why a gas, unlike a liquid, will always fill a container? | (2) |
| 4.6 Describe ONE way in which a person can change a gas to a liquid. | (1) |
| | [7] |

QUESTION 5

Learners half-filled each of two glass bottles with water. **Bottle A** contained hot water while **bottle B** contained cold water. Both bottles were covered with plastic sheets and ice-cubes were placed on top of the plastic sheets as shown in the diagrams below.



- 5.1 What does the dripping of water (water droplets) in Bottle A indicate? (1)
- 5.2 Why don't water droplets form on the plastic sheet of the cold water (bottle B)? (1)
- 5.3 Indicate which of the following expressions can be regarded as the INDEPENDENT VARIABLE, DEPENDENT VARIABLE OR CONTROLLED VARIABLE statements.

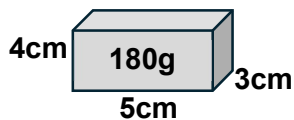
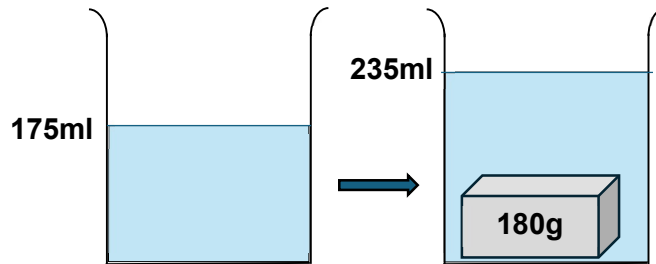
Write down the question number and your choice of variable ONLY.
(E.g. 5.3.4 Controlled variable)

- 5.3.1 Amount of water in each bottle. (1)
- 5.3.2 Temperature of the water in each bottle. (1)
- 5.3.3 Number of water droplets forming on the plastic sheet. (1)

[5]

QUESTION 6

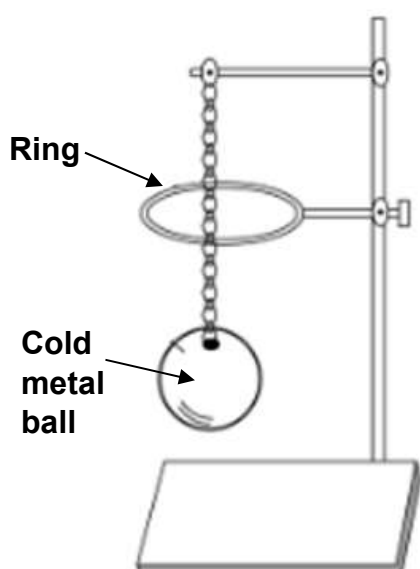
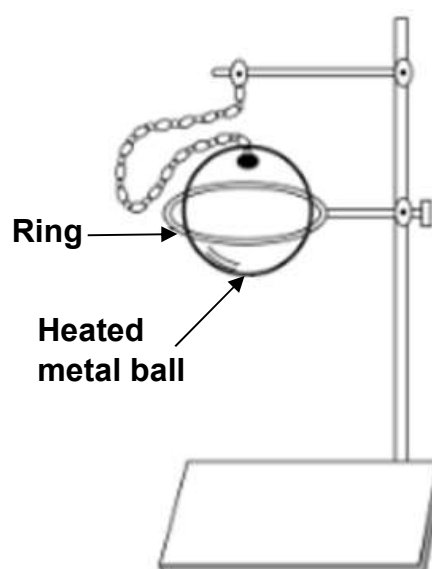
A rectangular glass block with a mass of 180 g and dimensions (length, breadth, and height) as shown in Figure 1 was placed into a beaker containing 175 ml of water. The glass block sank to the bottom of the beaker, causing the water level to rise to 235 ml (as seen in Figure 2).

**Figure 1****Figure 2**

- 6.1 Does the glass block have a HIGHER DENSITY or a LOWER DENSITY when compared to the DENSITY of the water? (1)
 - 6.2 Give a reason for your answer in 6.1. (1)
 - 6.3. Determine the volume of the glass block. (1)
 - 6.4 Calculate the density of the glass block. (3)
- [6]**

QUESTION 7

Study the metal ball-and-ring experiment below. When the metal ball is cold, it can pass through the metal ring. However, when the same metal ball is heated, it cannot pass through the metal ring.

**Before heating
At room temperature****After heating**

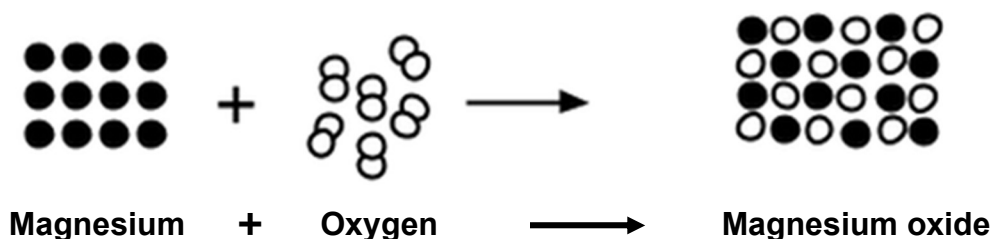
For each statement below, choose the correct word or phrase in brackets to make the statement true.

Write down ONLY the number and the correct word OR phrase.

- 7.1 The metal ball can pass through the ring before heating because it is (smaller than / larger than / same size as) the ring's inner diameter. (1)
- 7.2 When the metal ball is heated, metal particles (move closer together / do not move / move further apart). (1)
- 7.3 While heating the metal ball, the spaces between the metal particles will (remain the same / become larger / become smaller). (1)
- 7.4 Therefore the heated metal ball will (contract / expand / stay the same size). (1)
- 7.5 As a result, when the heated metal ball is placed on top of the metal ring, it (fits / does not fit) through the ring. (1)
- 7.6 In summary, as the temperature of the metal ball increases, its (density / volume / mass) also increases. (1)
- [6]**

QUESTION 8

A chemical reaction is represented by the following diagram:



- 8.1 What is a chemical reaction? (1)
- 8.2 Write the name(s) of the product(s) for this reaction. (1)
- 8.3 Write the name(s) of the reactants(s) for this reaction. (1)
- [3]**

TOTAL SECTION A: 10

TOTAL SECTION B: 40

GRAND TOTAL: 50

PERIODIC TABLE / PERIODIEKE TABEL

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)	
1 H 1	KEY/SLEUTEL											Atomic number <i>Atoomgetal</i>						2 He 4
3 Li 7	4 Be 9	<div><div>30 Zn 65</div><div>Symbol <i>Simbool</i></div></div>											5 B 11	6 C 12	7 N 14	8 O 16	9 F 19	10 Ne 20
11 Na 23	12 Mg 24	Mass number / <i>Massagetal</i>											13 Al 27	14 Si 28	15 P 31	16 S 32	17 Cl 35,5	18 Ar 40
19 K 39	20 Ca 40	21 Sc 45	22 Ti 48	23 V 51	24 Cr 52	25 Mn 55	26 Fe 56	27 Co 59	28 Ni 59	29 Cu 63,5	30 Zn 65	31 Ga 70	32 Ge 73	33 As 75	34 Se 79	35 Br 80	36 Kr 84	
37 Rb 86	38 Sr 88	39 Y 89	40 Zr 91	41 Nb 92	42 Mo 96	43 Tc	44 Ru 101	45 Rh 103	46 Pd 106	47 Ag 108	48 Cd 112	49 In 115	50 Sn 119	51 Sb 122	52 Te 128	53 I 127	54 Xe 131	
55 Cs 133	56 Ba 137	57 La 139	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	81 Tl 204	82 Pb 207	83 Bi 209	84 Po	85 At	86 Rn	
87 Fr	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		