KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL STANDARDISED ASSESSMENT

GRADE 11

PHYSICAL SCIENCES P2 (CHEMISTRY)

JUNE 2026

MARKS: 50

DURATION: 1 hour

This question paper consists of 6 pages and 2 data sheets.

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INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions. Answer ALL the questions in the ANSWER BOOK.
2. Start EACH question on a NEW page in the ANSWER BOOK.
3. Number the answers correctly according to the numbering system used in this question paper. downloaded from Stanmorephysics.com
4. Leave ONE line between two sub-questions, for example between QUESTION 2.1 and QUESTION 2.2.
5. You may use a non-programmable calculator.
6. You may use appropriate mathematical instruments.
7. You are advised to use the attached DATA SHEET.
8. Show ALL formulae and substitutions in ALL calculations.
9. Round off your final numerical answers to a minimum of TWO decimal places.
10. Give brief motivations, discussions et cetera where required.
11. Write neatly and legibly.

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QUESTION 1: MULTIPLE-CHOICE QUESTIONS

Four options are provided as possible answers to the following questions. Each question has only ONE correct answer. Choose the answer and write only the letter (A–D) next to the question number (1.1–1.4) in the ANSWER BOOK, for example 1.5 E.

1.1 Which ONE of the bonds between the atoms is most polar?

A C ─ C

B C ─ H

C C ─ O

D C ─ Cℓ (2)

1.2 Which ONE of the following intermolecular forces exists between Mg^{2+} and water when magnesium chloride ($MgC\ell_2$) dissolves in water?

A Hydrogen bonding

B Ion – dipole

C Ionic bonding

D London forces (2)

1.3 The statements below refer to the atom bonded to hydrogen in molecules for which there is hydrogen bonding between the molecules.
The atom bonded to hydrogen must:

(i) be large in size.
(ii) be highly electronegative.
(iii) have at least one lone pair of electrons.

Which of the above statements are TRUE?

A (ii) only

B (ii) and (iii) only

C (i) and (iii) only

D (i), (ii) and (iii) (2)

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1.4 Which ONE of the following substances has the highest boiling point?

A CO_2

B NH_3

C CH_4

D H_2O (2)

[2 X 4 = 8]

QUESTION 2 (Start on a new page.)

The letters **A** to **F** in the table represent SIX substances:

A	H_2	**B**	N_2	**C**	NH_3
D	CH_4	**E**	HCN	**F**	LiF

2.1 Define the term *chemical bond* in words. (2)

2.2 Write down the letter that represents the following:

2.2.1 A molecule that has only covalent bonds between its atoms and is non-polar (1)

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2.2.2 A non-polar molecule with polar bonds (1)

2.3 Write down the:

2.3.1 The shape of the molecule in substance **D** (1)

2.3.2 Lewis structure for the molecule in substance **E** (2)

2.4 Use electronegativity difference to identify the type of bond between Li and F in substance **F**. (3)

2.5 Write down the Lewis structure for the molecule in substance **B** and use this structure to explain why substance **B** is unreactive at room temperature and normal pressures. (3)

2.6 Substance **C** forms a dative covalent bond when reacting with the H^+ ion.

2.6.1 NAME the ion formed. (1)

2.6.2 State TWO requirements for the formation of dative covalent bonds. (2)

[16]

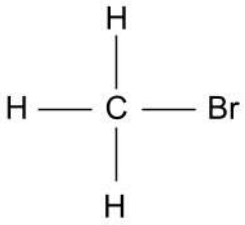
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QUESTION 3 (Start on a new page.)

A learner investigates bond energies in two similar compounds:



Chloromethane



Bromomethane

Refer to the table of bond energies below:

Bond	Bond Energy (kJ·mol^{-1})
C — Cℓ	340
C — Br	280

3.1 Define the term *bond energy* in words. (2)

3.2 Explain the difference in bond energies between the C — Cℓ and C — Br bonds. (3)

3.3 A sample of chloromethane ($CH_3C\ell$) has a mass of 5,05 g.
The TOTAL energy required to break all bonds in the sample is 157 kJ.

Calculate the bond energy of the C — H bond in kJ·mol^{-1}. (5)

3.4 Determine the energy required to break all bonds in 1 mole of bromomethane (CH_3Br). (2)

[12]

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QUESTION 4 (Start on a new page.)

The table below shows the vapour pressures at the same temperature for four substances:

Substances	Vapour Pressure (kPa)
F_2	120
$C\ell_2$	85
$HC\ell$	110
HF	15

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4.1 Define the term *vapour pressure* in words. (2)

4.2 Fully explain the difference in vapour pressure between F_2 and $C\ell_2$. (3)

4.3 Although $HC\ell$ has a larger molecular mass than HF, HF has a lower vapour pressure.
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Explain this observation. (3)

4.4 Which substance in the table has the highest boiling point? (1)

4.5 The solubility of $HC\ell$ and $C\ell_2$ in water is compared.

4.5.1 Define the term *solubility* in words. (2)

4.5.2 Which substance $HC\ell$ or $C\ell_2$ is more soluble in water?
Explain the answer. (3)

[14]

TOTAL: 50

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DATA FOR PHYSICAL SCIENCES GRADE 11

CHEMISTRY

TABLE 1: PHYSICAL CONSTANTS

NAME	SYMBOL	VALUE
Standard pressure	p^{θ}	1,013 x 10^5 Pa
Molar gas volume at STP	V_m	22,4 $dm^3 \cdot mol^{-1}$
Standard temperature	T^{θ}	273 K
Avogadro's constant	N_A	6,02 x 10^{23} mol^{-1}

TABLE 2: FORMULAE

$n = \frac{m}{M}$	$n = \frac{N}{N_A}$
$c = \frac{n}{V}$ *or* $c = \frac{m}{MV}$	$n = \frac{V}{V_m}$

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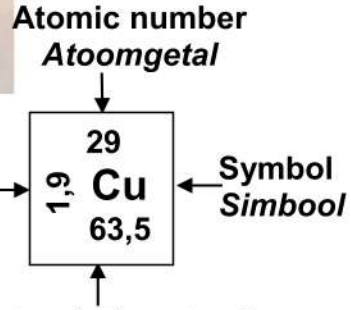
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TABLE 3: THE PERIODIC TABLE OF ELEMENTS

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 **H** 1																	**He** 4
1,0 **Li** 7	1,5 **Be** 9											2,0 **B** 11	2,5 **C** 12	3,0 **N** 14	3,5 **O** 16	4,0 **F** 19	**Ne** 20
0,9 **Na** 23	1,2 **Mg** 24											1,5 **Aℓ** 27	1,8 **Si** 28	2,1 **P** 31	2,5 **S** 32	3,0 **Cℓ** 35,5	**Ar** 40
0,8 **K** 39	1,0 **Ca** 40	1,3 **Sc** 45	1,5 **Ti** 48	1,6 **V** 51	1,6 **Cr** 52	1,5 **Mn** 55	1,8 **Fe** 56	1,8 **Co** 59	1,8 **Ni** 59	1,9 **Cu** 63,5	1,6 **Zn** 65	1,6 **Ga** 70	1,8 **Ge** 73	2,0 **As** 75	2,4 **Se** 79	2,8 **Br** 80	**Kr** 84
0,8 **Rb** 86	1,0 **Sr** 88	1,2 **Y** 89	1,4 **Zr** 91	**Nb** 92	1,8 **Mo** 96	1,9 **Tc**	2,2 **Ru** 101	2,2 **Rh** 103	2,2 **Pd** 106	1,9 **Ag** 108	1,7 **Cd** 112	1,7 **In** 115	1,8 **Sn** 119	1,9 **Sb** 122	2,1 **Te** 128	2,5 **I** 127	**Xe** 131
0,7 **Cs** 133	0,9 **Ba** 137	**La** 139	1,6 **Hf** 179	**Ta** 181	**W** 184	**Re** 186	**Os** 190	**Ir** 192	**Pt** 195	**Au** 197	**Hg** 201	1,8 **Tℓ** 204	1,8 **Pb** 207	1,9 **Bi** 209	2,0 **Po**	2,5 **At**	**Rn**
0,7 **Fr**	0,9 **Ra** 226	**Ac**															

Ce 140	**Pr** 141	**Nd** 144	**Pm**	**Sm** 150	**Eu** 152	**Gd** 157	**Tb** 159	**Dy** 163	**Ho** 165	**Er** 167	**Tm** 169	**Yb** 173	**Lu** 175
Th 232	**Pa**	**U** 238	**Np**	**Pu**	**Am**	**Cm**	**Bk**	**Cf**	**Es**	**Fm**	**Md**	**No**	**Lr**

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