

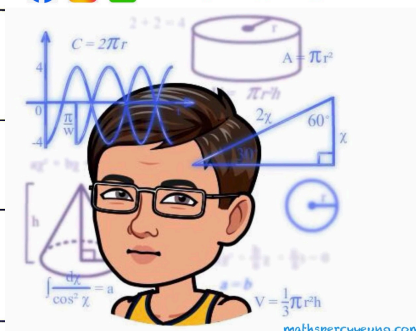
Term 2 Assessment 2025-2026

Grade : 9

Subject : Integrated Science
(Chemistry)

Date : ~5 JUN 2026

Time Allowed : 50 minutes



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Question-Answer Book

INSTRUCTION FOR SECTION A (MULTIPLE-CHOICE QUESTIONS)

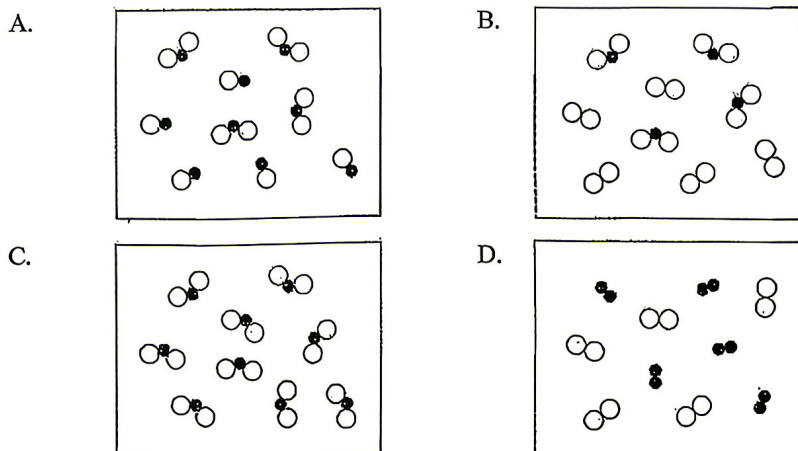
1. Read the instructions carefully. Each question carries 1 mark.
2. ANSWER ALL QUESTIONS. Put down your answer for each question (A, B, C or D) in the multiple-choice answer sheet provided.
3. You should mark only ONE answer for each question. If you mark more than one answer, you will receive NO MARKS for that question.
4. No marks will be deducted for wrong answers.

INSTRUCTION FOR SECTION B (STRUCTURED QUESTIONS)

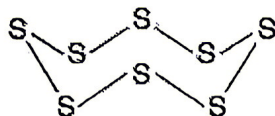
1. Answer ALL questions in the Question-Answer Book. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins. Answers written in the margins will not be marked.
2. Supplementary answer sheets will be supplied on request. Write your name, class and class number and fill in the question number on each sheet, and staple them INSIDE this Question-Answer Book.

Section A. Multiple-choice Questions (12 marks)

1. Which of the following diagrams can represent a mixture of compounds ?



2. The structure of a sulphur molecule in sulphur powder is shown below:



Which of the following bonds or attractive forces exist in sulphur powder ?

- (1) Covalent bond
 (2) Ionic bond
 (3) Van der Waals' forces

- A. (1) only
 B. (2) only
 C. (1) and (3) only
 D. (2) and (3) only

3. ⁺**M** is an element in the third period of the Periodic Table. **M** forms a carbonate which has the chemical formula M_2CO_3 . The chemical formula of the sulphate of **M** is likely to be

- A. M_2SO_4
 B. M_2SO_3
 C. MSO_4
 D. $M_2(SO_3)_3$

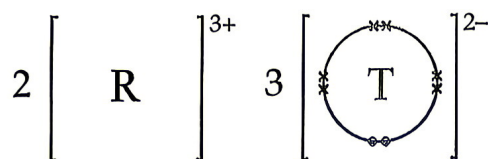
4. The following table shows the electronic arrangements of three chemical species.

Chemical species	Electronic configuration
X	2, 8, 6
Y²⁻	2, 8
Z⁺	2, 8

Which of the above elements belong to the same period of the Periodic Table ?

- A. **X** and **Y** only
 B. **X** and **Z** only
 C. **Y** and **Z** only
 D. **X**, **Y** and **Z**

5. The electron diagram of the compound formed between element **R** and element **T** is shown below (only electrons in the outermost shell are shown).



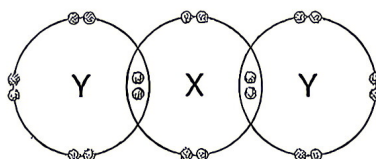
How many electrons are there in the outermost shell of an **R** atom and a **T** atom ?

- | | <u>R</u> | <u>T</u> |
|----|-----------------|-----------------|
| A. | 2 | 3 |
| B. | 2 | 8 |
| C. | 3 | 2 |
| D. | 3 | 6 |
6. The table below shows the electrical conductivity of four substances **W**, **X**, **Y** and **Z**.

Substance	Solid state	Molten state	Aqueous solution
W	X	X	
X	X	✓	
Y	X	X	
Z	✓	✓	(Insoluble in water)

(In the table, ✓ and X represent 'can conduct electricity' and 'cannot conduct electricity' respectively.)
Which of the substances is likely to be an ionic compound ?

- | | |
|----|----------|
| A. | W |
| B. | X |
| C. | Y |
| D. | Z |
7. The electron diagram of a compound formed between element **X** and element **Y** is shown below:



(Only electrons in the outermost shells are shown.)

Which of the following combinations concerning **X** and **Y** is correct ?

- | | <u>X</u> | <u>Y</u> |
|----|-----------------|-----------------|
| A. | carbon | sulphur |
| B. | silicon | oxygen |
| C. | oxygen | potassium |
| D. | sulphur | fluorine |

8. Rhenium, which has the relative atomic mass of 186.2, has two naturally occurring isotopes, ^{185}Re and ^{187}Re . What is the ratio of ^{185}Re to ^{187}Re in natural rhenium?

A. 1 : 2
 B. 2 : 1
 C. 2 : 3
 D. 3 : 2

9. Metals are malleable and ductile because

A. the delocalised electrons get more energy and move faster when colliding with other electrons.
 B. the metallic bonds between the layers of atoms and the delocalised electrons are weak. the layers of atoms can slide past one another without breaking the metallic bonds.
 D. the atoms are packed closely and the bonds holding them together are very strong.

10. An atom of element P has n protons and it forms ions with a charge of $2-$. An atom of element Q has $(n + 3)$ protons. Which of the following combinations about the compound formed between P and Q is correct?

	Nature of the compound	Formula of the compound
A.	ionic	Q_2P
B.	ionic	QP_2
C.	covalent	Q_2P
D.	covalent	QP_2

11. The following table shows the number of subatomic particles in particles X, Y and Z.

	X	Y	Z
Number of protons	35	35	35
Number of neutrons	46	45	46
Number of electrons	35	35	36

Which of the following statements concerning the three particles is / are correct?

- (1) Y is electrically neutral.
 (2) X and Y have the same mass number.
 (3) X and Z are isotopes.

A. (1) only
 B. (2) only
 C. (1) and (3) only
 D. (2) and (3) only

12. Consider the following statements and choose the best answer :

1st statement
 Calcium carbonate is a covalent compound.

2nd statement
 Covalent bonds exist in calcium carbonate.

A. Both statements are true and the 2nd statement is a correct explanation of the 1st statement.
 B. Both statements are true but the 2nd statement is NOT a correct explanation of the 1st statement.
 C. The 1st statement is false but the 2nd statement is true.
 D. Both statements are false.

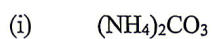
END OF SECTION A

Section B. Structured Questions (28 marks)

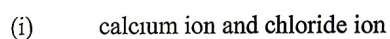
1. (a) Draw the electron diagrams of the following compounds, showing electrons in the outermost shells only.

	Electron diagram
Compound formed by C and S	
Hydrogen peroxide H_2O_2	

- (b) Name the following compounds. (2 marks)



- (c) Write the chemical formulae of the compounds formed by the following ions. (1 mark)



(1 mark)

Answers written in the margins will not be marked.

2. Consider the elements in the third period of the Periodic Table.

(a) What is the name of the group which magnesium belongs to ?

(b) (i) Name the semi-metal element in the period.

(1 mark)

(ii) State one use of this element in electronics.

(1 mark)

(c) One of the elements is very unreactive and can be used to fill the light bulbs.

(1 mark)

(i) Name the element.

(ii) By stating the electronic arrangement of the element, explain why it is unreactive.

(1 mark)

(2 marks)

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3. Element X has two isotopes, ${}_{27}^{75}\text{X}$ and ${}_{27}^y\text{X}$.

Given that the relative abundances of the two isotopes are both 50% and the relative atomic mass of X is 77.5, calculate the value of y.

(2 marks)

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4. The table below shows some physical properties of two chlorides, XCl and YCl_3 .

	Melting point / $^{\circ}\text{C}$	Electrical conductivity	
		At 700°C	At 850°C
XCl	800.7	Poor	Good
YCl_3	-93	Poor	Poor

- (a) Explain why XCl does NOT conduct electricity at 700°C , but it does at 850°C .

(2 marks)

- (b) YCl_3 has an octet structure. Draw the electron diagram of YCl_3 , showing electrons in the outermost shells only.

(1 mark)

- (c) Explain, in terms of structure and bonding, the difference in melting points between XCl and YCl_3 .

(2 marks)

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(d) The compound formed by X and Y has a melting point of 650 °C.

(i) Draw the electron diagram for the compound formed by X and Y, showing ELECTRONS IN THE OUTERMOST SHELLS only.

(1 mark)

(ii) State the chemical formula of the compound.

(1 mark)

(iii) Explain why the compound formed by X and Y has a lower melting point than XCl.

(1 mark)

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5. (a) Draw the three-dimensional diagram for the structure of graphite. Label the particles and name all the bonding involved.

(3 marks)

- (b) Consider the physical properties of graphite and calcium.

- (i) Explain why both graphite and calcium are good conductors of electricity.

(1 mark)

- (ii) In terms of bonding and structure, account for the fact that graphite has a higher boiling point than calcium.

(2 marks)

END OF SECTION B

END OF PAPER

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Page Total

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PERIODIC TABLE 周期表

GROUP 族

atomic number 原子序

		relative atomic mass 相對原子質量										0	