

**FORT STREET – YEAR 11 PRELIMINARY CHEMISTRY – HALF YEARLY -2008**

1. Atoms of element Q contain 16 protons, atoms of element R contain 9 protons.

Which one of the following gives the correct formula and bonding type for a compound of Q and R?

- (A)  $Q_2R$  with ionic bonds
- (B)  $Q_2R$  with covalent bonds
- (C)  $QR_2$  with ionic bonds
- (D)  $QR_2$  with covalent bonds.

2. A mixture of ethanol and water can be separated by:

- (A) centrifugation
- (B) distillation
- (C) decanting
- (D) crystallisation

3. An explosive synthesis reaction occurs when hydrogen gas combines with chlorine gas in the presence of light. Select the correct balanced equation that correctly identifies this reaction.

- (A)  $H(g) + Cl(g) \rightarrow HCl(g)$
- (B)  $H(g) + Cl(g) \rightarrow H_2(g) + Cl_2(g)$
- (C)  $H_2(g) + Cl_2(g) \rightarrow HCl(g)$
- (D)  $H_2(g) + Cl_2(g) \rightarrow 2HCl(g)$

4. The following table lists the physical properties of a range of different substances:

Substance	Melting Point ( $^{\circ}C$ )	Electrical conductivity in		
		solid state	liquid state	solution (aq)
W	-38	very good	very good	insoluble
X	882	very poor	good	good
Y	3730	fair	poor	insoluble
Z	146	very poor	very poor	very poor

Which substance is likely to be copper chloride?

- (A) W
- (B) X
- (C) Y
- (D) Z

5. The following table represents the chemical composition of:

Element	% by mass
Oxygen	46.6
Silicon	27.7
Aluminium	8.1
Iron	5.0
Calcium	3.6

- (A) the biosphere
- (B) the hydrosphere
- (C) the atmosphere
- (D) the lithosphere

6. Select the correct names for the following compounds:

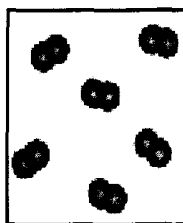
	$\text{Fe}_2\text{O}_3$	$\text{Ca}_3(\text{PO}_4)_2$	$\text{NCl}_3$
(A)	diiron (III) trioxide	calcium phosphide	nitrogen trichloride
(B)	iron (III) oxide	calcium phosphide	nitrogen chloride
(C)	iron (III) oxide	calcium phosphate	nitrogen trichloride
(D)	diiron (III) trioxide	calcium phosphate	nitrogen chloride

7. A chlorine ion has the same electron configuration as a:

- (A) neon atom
- (B) magnesium ion
- (C) bromine ion
- (D) oxygen ion

8. Substance A is classified as a:

- (A) mixture
- (B) compound
- (C) element
- (D) alloy



Substance A

9. The following table contains a selection of cations and anions

Cation	Anion
$\text{Al}^{3+}$	$\text{NO}_3^-$
$\text{NH}_4^+$	$\text{SO}_4^{2-}$
$\text{Sn}^{2+}$	$\text{PO}_4^{3-}$

Select the set of correct formulae:

- (A)  $\text{SnSO}_4$ ,  $\text{NH}_4(\text{PO}_4)_3$ ,  $\text{Al}(\text{NO}_3)_3$
- (B)  $\text{NH}_4\text{NO}_3$ ,  $\text{Sn}_3(\text{PO}_4)_2$ ,  $\text{Al}_3(\text{SO}_4)_2$
- (C)  $\text{Sn}_3(\text{PO}_4)_2$ ,  $\text{NH}_4(\text{SO}_4)_2$ ,  $\text{Al}(\text{NO}_3)_3$
- (D)  $\text{Al}_2(\text{SO}_4)_3$ ,  $(\text{NH}_4)_3\text{PO}_4$ ,  $\text{Sn}(\text{NO}_3)_2$

10. Which of the following elements is classified as a monatomic molecule?

- (A) nitrogen
- (B) oxygen
- (C) fluorine
- (D) neon

Question 11 (4 marks)

- a. Refer to your Periodic Table to identify the element in period 4, group I 1  
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- b. Write a balanced equation for its reaction with dilute sulfuric acid 1  
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- c. Use appropriate half equations to show that this reaction is an electron-transfer reaction 1  
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- d. Some metal elements will react with cold water  
Choose one such metal and write a balanced equation for this reaction 1  
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Question 12 (3 marks)

**Justify** why there are more metals available for people to use NOW then there were 200 years ago. Include relevant examples in your response 2

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Question 13 (4 marks)

During your preliminary course you constructed or used models to represent the boiling of water and the electrolysis of water

**Explain** using molecular diagrams, why the boiling of water is a physical change whereas the electrolysis of water is a chemical change 4

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Question 14 (4 marks)

**Explain** and compare the electrical conductivity of copper sulfate and silicon dioxide in a solid and molten state

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Question 15 (6 marks)

During your study of Preliminary course, you undertook an investigation to observe the effect of light on silver salts

- a. **Outline** the method you used and the observations you made. Ensure that your answer includes a balanced equation and explain a safety precaution 5

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- b. **Identify** an application of the use of this reaction 1

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Question 16 (5 marks)

a. **Construct** the Lewis dot formulas for the following compounds

Phosphorus trichloride (PCl <sub>3</sub> )	Lithium oxide (Li <sub>2</sub> O)

b. **Distinguish** between the formation and arrangement of the 3-Dimensional structure of phosphorus trichloride and lithium oxide 3

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Question 17 (4 marks)

**Account** for the uses of metals and non-metals in terms of their physical properties 4

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