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Candidate Name: () Class:	Session 1

KRANJI SECONDARY SCHOOL Preliminary Examination Secondary 4 Normal (Academic)

SCIENCE (CHEMISTRY)

Paper 3 Multiple Choice



5105/03 5107/03

Friday

2 August 2024

Papers 3 and 4 1 hour 15 minutes

KRANJI SECONDARY KRANJI

Additional Materials: Multiple Choice Answer Sheet

INSTRUCTIONS TO CANDIDATES

There are **twenty** questions in this paper. Answer **all** questions.

For each question there are four possible answers, A, B, C and D.

Choose the one you consider to be correct and record your choice in **soft pencil** on the OMR provided.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

You are advised to spend no more than **30 minutes** on Paper 3.

You may proceed to answer Paper 4 as soon as you have completed Paper 3.

Any rough working should be done in this booklet.

A copy of the Periodic Table is printed on page 7.

The use of an approved scientific calculator is expected, where appropriate.

Set by: Mr Joel Lee

This Question Paper consists of 7 printed pages and 1 blank page.

1 A student wishes to add exactly 15.8 cm³ of alkali to exactly 25.0 cm³ of acid.

Which apparatus should the student use to measure these volumes?

	alkali	acid
Α	burette	beaker
В	burette	pipette
С	measuring cylinder	pipette
D	pipette	burette

2 The diagram below shows a chromatogram obtained from three different samples of food colouring, X, Y and Z.

	yellow	• red
• green	green	
yellowred		yellowred
Sample X	Sample Y	Sample Z

How many different yellow dyes are present in the samples?

- **A** 1
- **B** 2
- **C** 3
- **D** 4

Which of the following substances is a liquid at room temperature (25°C)?

	melting point/°C	boiling point/°C
Α	-117	10
В	-20	80
С	-5	15
D	35	120

- 4 Which of the following statements regarding liquids and gases is false?
 - **A** Both gas and liquid particles are disorderly arranged.
 - **B** Gas particles are much further apart than liquid particles.
 - **C** Gas particles are much smaller than liquid particles.
 - **D** When a liquid turns into a gas, its particles gain energy.

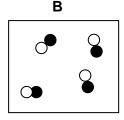
5 An atom of nickel is represented by the symbol $^{59}_{28}$ Ni.

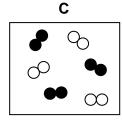
How many neutrons does this nickel atom contain?

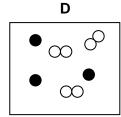
- **A** 28
- **B** 31
- **C** 59
- **D** 87
- 6 Which of the following diagrams does **not** represent a mixture?

A

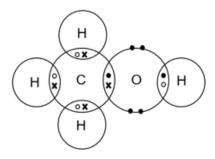
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7 The 'dot-and-cross' diagram shows a molecule of methanol.



Which of the following statements is false?

- **A** Each carbon atom shares four electrons in total.
- **B** Each hydrogen atom only forms one bond.
- **C** The chemical formula of methanol is CH₄O.
- **D** There is a double bond between the carbon and oxygen atom.
- 8 An oxide of nitrogen N_xO_y has a relative molecular mass of 92.

What are the values of x and y?

	Х	у
Α	1	1
В	1	2
B C	2	4
D	4	4

9 What are the charges of the ions in $Fe_2(CO_3)_3$?

	Fe	CO ₃
Α	2-	3+
A B C	2+	3+ 3-
С	3- 3+	2+
D	3+	2-

10 An incomplete word equation is given.

hydrochloric acid + metal carbonate → salt + P + water

What is P?

- A carbon dioxide
- **B** hydrogen
- C metal hydroxide
- **D** oxygen

11 The oxide of element R dissolves in water to form a solution of pH 3.

What could be a possible identity of R and the type of oxide it forms?

	element R	type of oxide
Α	copper	acidic
В	iron	basic
С	nitrogen	acidic
D	zinc	amphoteric

12 The diagram below shows part of the Periodic Table of elements.

			·						Χ	
V										Υ
	W									
									Z	

Which two elements have the same number of electron shells?

- A W and Y
- **B** V and X
- **C** V and Y
- **D** X and Z

- Which is a property of **all** metals?
 - **A** They conduct electricity.
 - **B** They have high melting points.
 - **C** They react readily with oxygen.
 - **D** They react vigorously with water.
- 14 A student carried out experiments on three different metals with cold water and steam.

They recorded their results in the following table.

metal	with cold water	with steam
R	no reaction	hydrogen formed
S	no reaction	no reaction
Т	hydrogen formed	hydrogen formed

What is the order of reactivity of the metals?

	most reactive	•	least reactive
Α	R	S	Т
В	S	R	T
С	T	R	S
D	Т	S	R

- Which of the following methods is the least effective in preventing an iron nail from rusting?
 - A Coating the iron nail with oil
 - **B** Galvanising the iron nail with zinc
 - **C** Painting the iron nail
 - **D** Washing the iron nail with water
- 16 Which row describes the main processes in the carbon cycle correctly?

	give(s) out carbon dioxide	take(s) in carbon dioxide
Α	combustion	photosynthesis, respiration
В	combustion, respiration	photosynthesis
С	photosynthesis	combustion, respiration
D	photosynthesis, respiration	combustion

- 17 Which statement describes a homologous series?
 - A All compounds have different chemical properties.
 - **B** All compounds have the same general formula.
 - **C** All compounds have the same names.
 - **D** All compounds have the same physical properties.

- 18 A student makes the following statements about biofuels.
 - 1 Biofuels can be made from natural gas.
 - 2 Biofuels can be made from plants.
 - 3 Biofuels have no impact on the environment.

Which of the statements is/are true?

- A 2 only
- **B** 1 and 2
- **C** 2 and 3
- **D** 1, 2 and 3
- 19 Propane reacts with chlorine under UV light according to the following reaction.

$$C_3H_8 + Cl_2 \rightarrow C_3H_7Cl + HCl$$

What type of reaction is this?

- **A** addition
- **B** combustion
- **C** cracking
- **D** substitution
- Which diagram represents an unsaturated hydrocarbon?
 - **A** H-C-C

 - C H C H

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lanthanoids

actinoids

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