



GREENRIDGE SECONDARY SCHOOL
Mid-year Examination 2007
Pure Chemistry 5072
Paper 1
Secondary Three Express

Date : 8 May 2007

1 h

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Name: _____ ()

Class: 3E1

Parent's signature & date: _____

INSTRUCTIONS TO CANDIDATES

Do **not** open this booklet until you are told to do so.

Write your name and index number on the answer sheet in the spaces provided.

There are **forty** 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 correct and record your choice in soft **2B** pencil on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

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

Any rough working should be done in this booklet.

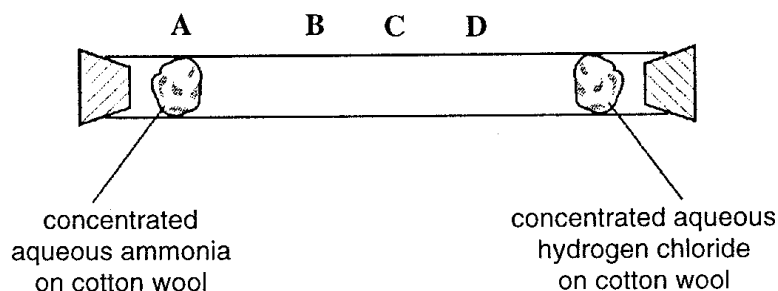
A copy of the Periodic Table is printed on page **10**.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO

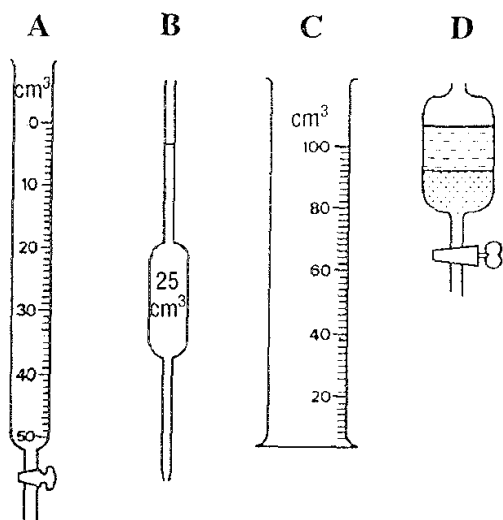
Name of Setter: Mr Victor Lee

This question paper consists of **10** printed pages including this cover page

5. Ammonia, $M_r = 17$, and hydrogen chloride, $M_r = 36.5$ diffuse in the tube shown, When these gases meet, they produce a white cloud of ammonium chloride. Where in the tube does the white cloud first appear?

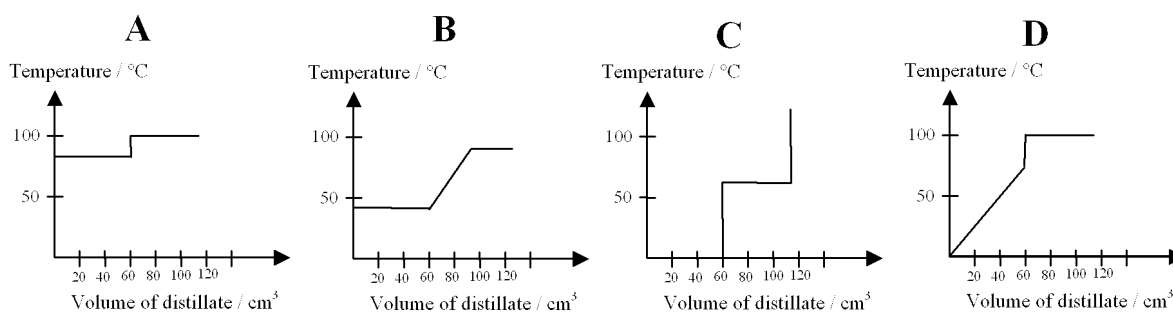
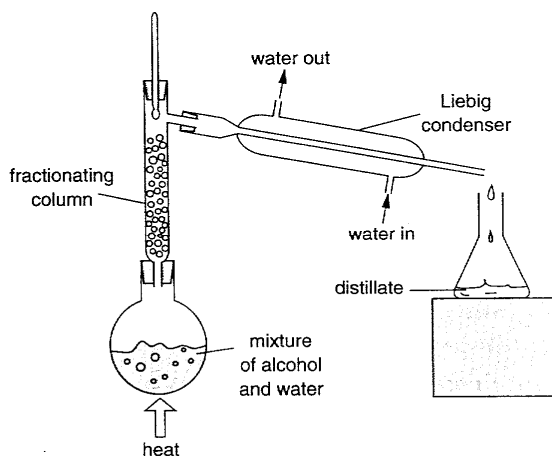


6. Which one of these statements about the kinetic theory of matter is **untrue**?
- A** All matter consists of individual particles.
B Gases have the least kinetic energy as their particles are farthest apart.
C At absolute zero (0°C) particles are stationary
D As the temperature increases, so does the kinetic energy of the particles.
7. Which gas is obtained industrially by fractional distillation?
- I Hydrogen
 II Oxygen
 III Nitrogen
 IV Methane
- A** I and III only
B II and IV only
C II and III only
D III and IV only
8. Which of the following pieces of apparatus is most suitable for accurately measuring out 21.4 cm^3 of water?



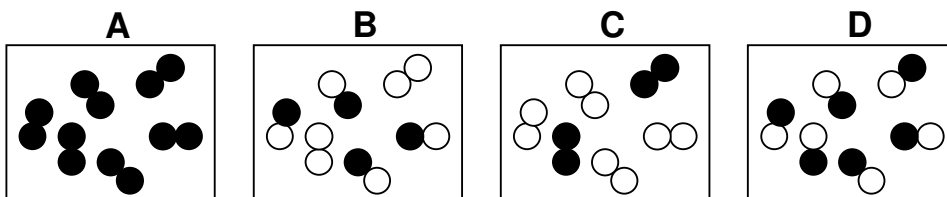
9. The diagram shows the fractional distillation apparatus which was used to separate alcohol (boiling point 78°C) and water (boiling point 100°C).

Which one of the following graphs best shows how the temperature varied with the volume of distillate collected?



10. Fermentation converts glucose into alcohol. Fractional distillation is used to separate alcohol from water in fermented liquor. This process depends upon the
- A** ability of the alcohol to ignite.
 - B** boiling point of alcohol.
 - C** flammability of alcohol.
 - D** colourless nature of both liquids.

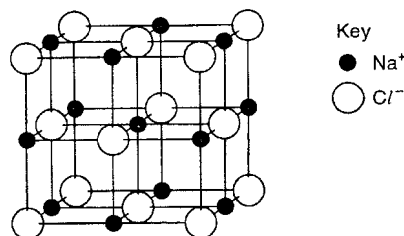
11. Which one of these represent a pure compound?



12. Which of the following methods is most suitable for separating a mixture of sodium iodide and iodine?
- A** Chromatography
 - B** Filtration
 - C** Fractional distillation
 - D** Sublimation

13. When a liquid is distilled, which one of the following processes occur in the order shown?
- sublimation and boiling
 - boiling and melting
 - boiling and condensation
 - melting and boiling
14. Which of the following groups contains three metallic elements?
- argon, phosphorus, copper
 - zinc, platinum, aluminium
 - chlorine, air, copper
 - magnesium, bronze, brass
15. Fullerene was first discovered by a group of scientists in 1985. The formula of fullerene is C_{60} . From this information alone, we can deduce that
- fullerene contains only one element.
 - fullerene is a compound of 60 elements.
 - fullerene is a mixture of 60 atoms.
 - fullerene is a molecule of 60 elements.
16. Which of the following substances does **not** have a fixed boiling point?
- Bronze
 - Sea water
 - Potassium
 - Chlorine gas
- I and II only
 - I and III only
 - II and III only
 - III and IV only
17. A compound has the formula $CuSO_4 \cdot 5H_2O$. How many elements and atoms are present in the formula shown?
- | | <u>Number of elements</u> | <u>Number of atoms</u> |
|----------|---------------------------|------------------------|
| A | 3 | 11 |
| B | 3 | 21 |
| C | 4 | 11 |
| D | 4 | 21 |

18. The diagram shows the structure of sodium chloride, Na^+Cl^- .



Which statement about this structure is correct?

- Each sodium ion is in contact with only four chloride ions.
- Each sodium ion is in contact with only six chloride ions.
- Each chloride ion is in contact with only one sodium ion.
- Each chloride ion is in contact with only four sodium ions.

19. Which substance could be potassium chloride?

Substance	Melting point / °C	Conduction of electricity	
		In molten form	In aqueous form
A	100	Poor	Poor
B	100	Poor	Good
C	776	Poor	Insoluble
D	776	Good	Good

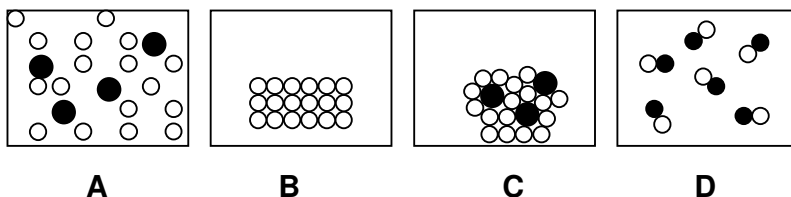
20. Which statement is true about atoms?

- A** Atoms are the smallest particles of a molecule that can still have the chemical properties of that molecule.
- B** Atoms are the smallest particles of an element that can still have the chemical properties of that element.
- C** Atoms are the smallest particles of an element that can still have the physical properties of that element.
- D** Atoms are the smallest particles of a molecule that can still have the physical properties of that molecule.

21. Which property proves that a shiny element is a metal?

- A** It has a high melting point.
- B** It conducts electricity in the solid state.
- C** It conducts electricity only in the molten state
- D** It sinks when it is placed in water.

22. The diagrams represent the arrangement of particles in solids, liquids and gases.



Which diagram represents a salt solution?

23. In which one of the following sets do both particles have the same total number of electrons?

- A** Cl^- and F^-
- B** N^{3-} and O^{2-}
- C** K^+ and Na^+
- D** Ne and Cl^-

24. Which one of the following ions does **not** exist?

- A** $\text{Ca}^{2+}_{(\text{aq})}$
- B** $\text{Fe}^{3+}_{(\text{aq})}$
- C** $\text{Cl}^{+}_{(\text{aq})}$
- D** $\text{Fe}^{2+}_{(\text{aq})}$

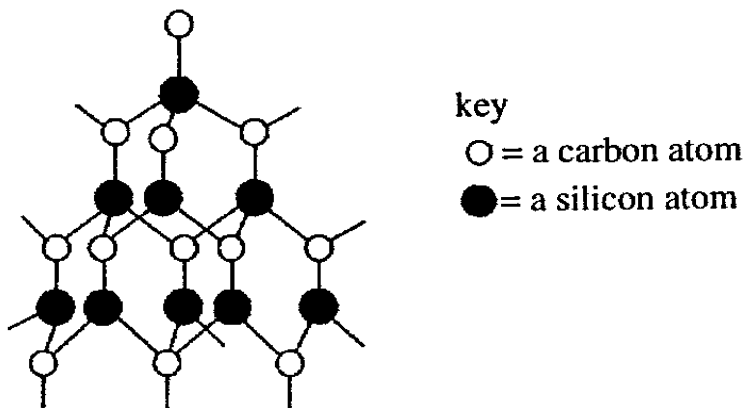
25. Particles in the crystal lattice of sodium chloride are held together by

- A** covalent bonds.
- B** ionic bonds.
- C** metallic bonds.
- D** positive ions in a 'sea of electrons'.

26. Isotopes of the same element have the same number of
- I electrons.
 - II neutrons.
 - III protons.
- A** I and II only
B I and III only
C II and III only
D I, II and III only
27. The ions ${}^{24}_{11}\text{Na}^+$ and ${}^{24}_{12}\text{Mg}^{2+}$ have the same
- A** proton number.
 - B** atomic number.
 - C** number of electrons.
 - D** number of neutrons.
28. Which one of the following substances conducts electricity by the movement of ions?
- A** sodium metal
 - B** solid sodium chloride
 - C** molten potassium chloride
 - D** graphite
29. Element **X** has an electronic configuration of 2,7. Element **Y** has an electronic configuration of 2,1. What is likely to form if **X** and **Y** combine?
- A** A covalent compound **YX₇**
 - B** A covalent compound **YX**
 - C** An ionic compound **YX₇**
 - D** An ionic compound **YX**
30. A compound X contains chlorine and one other element. Which one of the following properties of X indicates most clearly whether the bonds in X are ionic or covalent?
- A** X is a crystalline solid at room temperature.
 - B** X does not conduct electricity when solid.
 - C** X conducts electricity when molten.
 - D** X is almost insoluble in water.
31. A crystal of sodium chloride is held together by
- A** covalent bonds.
 - B** shared pairs of electrons.
 - C** positive ions in a 'sea of electrons'.
 - D** the attraction of oppositely charged ions.
32. Which of the following is most likely to be the melting point of an ionic solid?
- A** -182°C
 - B** 0°C
 - C** 210°C
 - D** 1243°C
33. The formation of the charged particles to produce an ionic compound is due to
- A** the charging of the atoms by friction as they collide with each other.
 - B** the sharing of electrons between metallic and non-metallic atoms.
 - C** the transfer of electrons from metallic to non-metallic atoms.
 - D** the transfer of electrons from non-metallic to metallic atoms

34. What is the number of pairs of shared electrons in a methane molecule (CH_4)?
- A** 1
B 2
C 3
D 4

35. The compound silicon carbide has the structure shown in the diagram.



Which set of properties will silicon carbide have?

- | <u>physical state</u> | <u>when strongly heated in oxygen</u> |
|--------------------------|---|
| A soft slippery | solid burns, leaving no solid residue |
| B hard solid | melts at high temperature, no chemical change |
| C very hard solid | burns slowly, leaving no solid residue |
| D very hard solid | burns slowly, giving a solid residue and a colourless gas |

36. Which of the following statements correctly describes a trend in the properties of the elements from left to right across period 3 of the Periodic Table?

- I The valency of element increases from 1 to 8.
 II The number of valence electrons of element increases from 1 to 8.
 III The elements change from metals to non-metals.
 IV The number of protons in an atom decreases.

- A** I and II only
B II and III only
C I, II and III only
D II, III and IV only

37. Which feature of a metal's structure is responsible for it conducting electricity?

- A** It contains positive ions.
B It has a "sea of electrons".
C Its ions are tightly packed together.
D Its positive ions attract electrons.

38. If the reaction of sodium with water is described as rapid, the reaction of rubidium (atomic number 37) with water is likely to be

- A** explosive. **C** slightly faster than sodium.
B moderately fast. **D** slower than that of lithium.

39. Which of the following descriptions is **not** true about the noble gases?
- A** They are all inert gases.
 - B** They are monatomic.
 - C** They are insoluble in water.
 - D** They all have 8 valence electrons.
40. Which one of the following facts suggests that iron is a transition metal?
- A** Iron reacts with dilute hydrochloric acid to liberate hydrogen.
 - B** Iron (III) oxide is basic.
 - C** Iron (III) ions are yellow in aqueous solution.
 - D** Iron (III) chloride sublimes on heating.

~ **The End** ~

