

Stream.....

[illegible]

SECTION A (50 MARKS)

1. State how the following mixtures can be separated. (05marks)

Mixtures	Method of separation
a) Salt solution	
b) sodium chloride and potassium nitrate	
c) ammonium chloride and sodium chloride	
d) sulphur and iron fillings	
e) crude oil	

2. A mixture of soot and charcoal was burnt in excess air for some time to form gas Y. Gas Y was then bubbled through aqueous solution of calcium hydroxides for a short time.

a) i) Name gas Y. (1/2 marks)

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ii) write equation for the reaction leading to formation of gas Y. (1 1/2 marks)

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b) i) State what was observed when gas Y was bubbled through the aqueous solution of calcium hydroxide for a short time. (1/2 marks)

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c) State one use of

i) Soot (1/2 marks)

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ii) Wood charcoal (1/2 marks)

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3. Atom of element X and Q are represented as $^{24}_{12}\text{X}$ and $^{35}_{17}\text{Q}$

a) Determine the number of neutrons in atom; (1 mark)

i) X

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.....

ii) Q

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b) Write the electronic configuration of; (1 mark)

i) X

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.....

ii) Q

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.....

c) X and Q combine to form a compound Z.

i) Write the formulae of the particles in Z. (1 mark)

ii) State whether Z is a liquid at room temperature, or a gas at room temperature, or a solid that conducts electricity in molten or aqueous state. (1 mark)

iii) Give a reason for your answer in C(ii). (1mark)

4. a) Define the term an oxide (1 mark)

b i) An oxide contains 43.7% phosphorous. Determine the simplest formula of the oxide. (P=31, O=16) (3 marks)

iii) Name the oxide. (1 mark)

5. a) Define the term an alloy. (1 mark)

b) Copper is one of the metals found in a number of alloys.

i) Name any two alloys of copper. (1 mark)

iii) State any one use of each of the alloys named in (b)(i) above. (2 marks)

d) State two reasons as to why the use of alloys is preferred to pure elements. (2 marks)

6. Copper(II) hydroxide decomposes when strongly heated according to the equation below.



If 3.6g of copper(II) hydroxide was strongly heated.

a) Calculate the number of moles of

i) Copper(II) hydroxide decomposed. (Cu=64, O=16, H=1) (1½ marks)

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ii) Copper(II) oxide formed. (1½ marks)

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b) Determine the mass of copper(II) oxide formed. (2 mks)

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7. Carbon monoxide is a reducing agent. It reduces oxides of iron to iron metal.

a) Write the formula of any two common oxides of iron. (2 mks)

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b) Write equation for reaction in which carbon monoxide reduces any of the two oxides in (a) above.

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c) State what is observed when iron is left exposed in moist air for some days. (1 mk)

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d) Name the process that occurs.

($\frac{1}{2}$ mks)

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8. a) Sodium metal was burnt in plentiful supply of oxygen .

i) State what was observed.

(1 mk)

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.....

ii) Write an equation for the reaction that took place.

(1 mk)

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b) The product from (a) was added to water in a beaker.

i) State what was observed.

(1 $\frac{1}{2}$ marks)

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ii) Write equation for the reaction that took place.

(1 $\frac{1}{2}$ marks)

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9. a) Define the term hydrocarbon.

(1 mk)

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b) Name one hydrocarbon which is;

i) saturated

(01marks)

.....

ii) Unsaturated

(01marks)

.....

c) i) Name the reagent which can be used to distinguish between the hydrocarbons in (b) above.

(1 mk)

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ii) State what is observed when each of the hydrocarbons in (b) is reacted with reagent named above. (2 mks)

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10. complete each of the following equations.(4½ marks)

a) $\text{CuCO}_3(\text{s}) \longrightarrow$

b) $\text{Pb}(\text{NO}_3)_2 (\text{s}) \longrightarrow$

c) $\text{NaNO}_3 (\text{s}) \longrightarrow$

SECTION B(30MARKS)

Attempt ant two questions from this section.

11. a) Define the following terms giving an example in each case.

i) Normal salt (11/2marks)

ii) Acid salt (11/2 marks)

b) Name the type of hard water caused by the of;

i) Calcium sulphate (1/2 marks)

ii) Calcium hydrogen carbonate (1/2 marks)

c) Excess copper (II) carbonate was added to dilute sulphuric acid.

i) State what was observed. (11/2 marks)

ii) Write equation for the reaction that took place. (11/2 marks)

iii) Outline how pure dry crystals of the product would be obtained. (5 marks)

d) i) Define the term direct synthesis. (1 mark)

ii) Give two examples of salts which can be prepared by direct synthesis except anhydrous iron (III) chloride. (2 marks)

12 a) i) Name the reagents used to prepare dry ammonia gas in the laboratory. (1 mark)

ii) State the condition for the reaction that leads to preparation of ammonia gas in the laboratory.

(1/2 marks)

iii) Write equation for the reaction that occurs between the named reagents to produce ammonia.

(11/2 marks)

b) Draw a labeled diagrams showing a setup of apparatus used to prepare dry ammonia gas in the laboratory. (5 marks)

c) Explain with the aid of equation (s) why;

i) Concentrated sulphuric acid cannot be used to prepare ammonia gas. (31/2 marks)

ii) Ammonia gas is **NOT** collected over water. (21/2 marks)

d) Dry ammonia reacts with heated copper (II) oxide according to the following equation.



i) State what would be observed. (1 mark)

ii) Calculate the mass of copper (II) oxide that would react with 840cm^3 of ammonia at s.t.p. (Cu=64, O=16, Molar gas volume at s.t.p is 22.4 dm^3). (2 marks)

13. a i) define the term allotropes.(01marks)

ii) State three differences between the crystalline allotropes of carbon.(03marks)

b) with a well labeled diagram, describe how a dry sample of carbon dioxide gas can be prepared from the laboratory.(06marks)

c) Write the equation(s) to show how carbon dioxide gas reacts with;

i) sodium hydroxide solution.(03marks)

ii) burning magnesium.(1½ marks)

d) State one use of carbon dioxide gas.(½ marks)

14. 25.0 cm^3 of a 0.1M sodium hydroxide required 25 cm^3 of hydrochloric acid for complete neutralization.

a) Define the term neutralization.(01marks)

b) Write equation for the reaction which took place(1½ marks)

c) Determine the;

i) moles of sodium hydroxide that reacted(03marks)

ii) moles of hydrochloric acid that reacted(02marks)

iii) concentration of hydrochloric acid in moles per litre.(03marks)

d i) Define the term basicity of acid.(01marks)

ii) 2.5 g of sulphuric acid was dissolved in 20cm^3 of water to make a solution. Determine the molarity of hydrogen ions formed(3½ marks)

END