NAME.....STREAM.....

DEPARTMENT OF CHEMISTRY

S.2 CHEMISTRY PAPER/2

TIME: 2HOURS

INSTRUCTIONS

- Attempt all question in sections A. Answers to the questions in the spaces provided.
- Attempt only one question in section B. answer to these questions must be written in the answer sheets provided
- In both sections, all working must be clearly shown.

SECTION A (50 MARKS)

1. Air is a mixture consisting mainly of the gases **X** and **Y** in the ratio of 1:4 by volume respectively.
   (a) Name gas
      (i) **X**..... (1mk)
      (ii) **Y**..... (1mk)
   (b) (i) State a suitable method by which the mixture of **X** and **Y** can be separated industrially. (1mk)
   .....
   (ii) Give a reason for the choice of the method you have stated in (b) (i). (1mk)
   .....
   .....
   (c) Name one process during which the concentration of **X** in the atmosphere can be;
      (i) Increased .....(½ mk)
      (ii) Decreased.....(½ mk)

2. The atomic numbers of elements **X, Y**, and **Z** are 18, 16 and 19 respectively.
   (a) State the
      (i) Group in the periodic table to which **X** belong (1mk)
      .....
      (ii) Valency of **Y** (1mk)
      .....
      (iii) Period in the periodic table to which **Z** belongs. (1mk)
      .....

(b) Write the formula of the compound that can be formed when **X** reacts with:

(i) **Y**..... (1mk)

(ii) **Z**..... (1mk)

3. Zinc powder was added to a solution of copper(II) sulphate solution in a test tube. A brown solid and a colourless solution were formed.

(a) (i) Identify the brown solid (½ mk)

.....

(ii)Write an equation for the formation of the brown solid. (1 ½ mks)

.....

(b) (i)Identify the colourless solution. (½ mk)

.....

(ii)Write an equation for the formation of the colourless solution (1 ½ mks)

.....

(iii) Write an overall equation for the reaction between Zinc powder and copper(II) sulphate solution. (1 ½ mks)

.....

.....

(iv) What reaction has taken place? (½ mk)

.....

4. The figure1 below shows a set up of apparatus to investigate the reaction between metals and steam.

(a) Suggest a suitable metal that could be used in the experiment. (1mk)

.....

(b) (i) What would be observed in the glass tube? (1 mk)

.....

.....

(ii)Write the equation of the reaction in the glass tube. (1 ½ mks)

.....

(c) (i) Suggest the gas that is being burnt at the end of the tube. (1mk)

.....

(ii)Write equation for the combustion of gas in (c) (i). (1 ½ mks)

.....

5. Figure 2 below shows the set up of apparatus used to identify the products of a burning candle.

(a) Name the substances

(i) **P**..... (1mk)

(ii) **Q**..... (1mk)

(iii) **R**..... (1mk)

(b) State the role of **P** (½ mk)

.....

(c) State what is observed in the test tube. (½ mk)

.....

6. (a) Define the terms

(i) A normal salt (1mk)

.....

.....

(ii) An acid salt (1mk)

.....

(c) Give one example of

(i) A normal salt (1mk)

.....

(ii) An acid salt (1mk)

.....

7. Paper of the periodic table is shown below

Group							
I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**
			W		**V**		**Z**
	Y	**T**				**Q**	

(a) State the;

(i) Most reactive metal (1mk)

.....

(ii) Most reactive non-metal (1mk)

.....

(iii) Atom that forms the largest anion. (1mk)

.....

(iv) The most non-reactive element. (1mk)

.....

(b) Write the formula of the compounds formed between the following pairs of element and in case state the type of bonding.

(i) **W** and **Q** (1mks)

.....

.....

(ii) **T** and **V** (1mk)

.....

.....

8. Show how the following mixtures can be separated and give a reason way that method is chosen.

Mixture	**Method of separation**	**Reason**
Water and Oil	.....	.....
Water and ethanol	.....	.....
Sand and water	.....	.....
Iron fillings and sulphur	.....	.....
Iodine and sand	.....	.....

9. A crystal of potassium mangnete(VII) was placed at the corner in a trough of water as shown in the figure below and allowed to stand for about 30 minutes.

(a) State what was observed after 30 minutes. (1mk)

.....

.....

(b) Name the process that occurred. (1mk)

.....

(c) State the purpose of the experiment. (1mk)

.....

10. When hydrogen peroxide was exposed to sunlight, a gas was formed

(a) (i) Name the gas..... (1mk)

(ii) State how the gas could be identified. (1 ½ mks)

.....

.....

(b) Write an equation leading to formation of the gas. (1 ½ mks)

.....

.....

(c) (i) Name one reagent that can be used to speed up the rate of formation of the gas. (1mk)

.....

(d) Write the chemical formula of the reagent you have named in C (i). (1mk)

.....

SECTION B (15MARKS)

Attempt only one question

11. (a) With the aid of diagrams describe an experiment you would carry out to show that rusting requires both oxygen and water in order to occur. (11mks)

    (b) Describe four ways of preventing rusting. (4mks)

12. (a) Draw a set up of apparatus that can be used to prepare a dry sample of carbon dioxide gas from dilute hydrochloric acid and calcium carbonate. (4 ½ mks)

    (b) Explain why;

    (i) Concentrates sulphiric acid is used to dry carbon dioxide gas

    (ii)Carbon dioxide gas is used in fire extinguishers. (1mk)

    (c) State what is observed and write equation(s) for the reaction that takes place when;

    (i) Excess carbon dioxide gas is bubbled through calcium hydroxide solution (4mks)

    (ii) Excess carbon dioxide is bubbled through sodium hydroxide solution. (4mks)

    (d) State the impact of too much carbon dioxide gas to the atmosphere. (1mk)

END

"CHEMISTRY FOR LYFE"