SURNAME …….. FIRST NAME ……..……..

JUNIOR SCHOOL …….. SENIOR SCHOOL ……

SupaScience

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

LEVEL 2

CHEMISTRY

Practice paper 1

Please read this information before the examination starts

- This examination is 40 minutes long.
- The answers should be written on the question paper.
- Answer all the questions.
- A protractor may be helpful.
- Calculators may be required.

1. In each of these questions, underline the word or phrase which you think makes the best answer

a) If an acid solution had been NEUTRALISED by an alkali what pH number might it have?

pH1 **pH5** **pH7** **pH13**

b) A neutral chemical might be a solution of

indigestion mixture **table salt** **citric acid** **garden lime**

c) A chemical that changes colour when water is added is most likely to be

zinc oxide **copper foil**
anhydrous cobalt chloride **magnesium ribbon**

d) A chemical that forms a purple vapour when heated could be

iodine **magnesium** **copper sulphate** **carbon**

e) A chemical that burns with a bright white flame could be

zinc oxide **copper foil** **magnesium ribbon** **cobalt chloride**

f) a chemical that would *not* change in mass when heated could be

magnesium ribbon **copper sulphate** **cobalt chloride** **copper oxide**

g) an element might be

water **air** **chalk** **oxygen**

h) In salt solution the salt is described as the

Solvent **solute** **filtrate** **distillate**

(1 mark each)

2. From the list below pick the best process to use for each question which follows:

evaporation filtration distillation chromatography

i How would you obtain crystals of salt from sea water

. . . . . ***Evaporation*** . . . . . .

ii How could you obtain fresh water from sea water

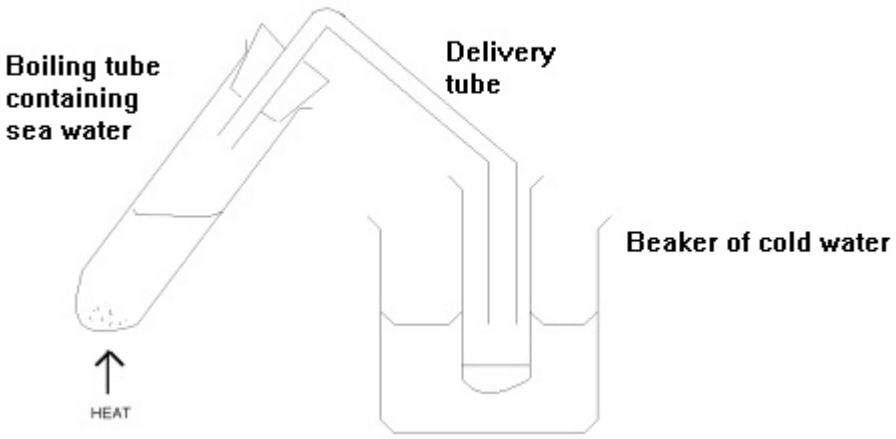
. . . . . ***Distillation .*** . . . . . .

iii How would you remove some pieces of sand from sea water

. . . . . ***Filtration .*** . . . . . .

(3)

3. Draw a neat labelled diagram of the apparatus you would use to obtain pure water from sea water.



4 marks

4. Fill in the table below which shows the result of an experiment to add universal indicator to some different solutions

Name of chemical	Colour of universal indicator	pH number	Acid, alkali or Neutral
Washing soda	***BLUE***	pH 10	***ALKALI***
WATER	Green	***pH7***	Neutral
Citric acid	***YELLOW / ORANGE***	pH 4	***ACID***
Vinegar	Yellow	***pH6***	***ACID***
Indigestion powder	***BLUE***	***pH8-pH10***	Mild Alkali

5. A solution of salt (sodium chloride) can be prepared by adding dilute sodium hydroxide solution to dilute hydrochloric acid in a conical flask until the solution is neutral.

a.) How could you show when the solution was exactly neutral?

……***……add litmus indicator to the hydrochloric acid. When the litmus loses its red colour and on the point of turning blue the solution is neutral***
(1 mark if you use universal indicator instead of litmus)

b) How could you obtain salt crystals from the resulting solution?

Place the solution in an evaporating dish over a beaker of boiling water and warm the dish until crystals just start to appear. Stop heating and poor away the liquid leaving the crystals

c) Write the word equation for the reaction that takes place:

Hydrochloric acid + sodium hydroxide → Sodium chloride + water

2 marks

6. A boy heated a mixture of powdered wood charcoal (carbon) and copper oxide in an open test tube and saw a red glow spread through the mixture.

When the mixture had cooled a residue of pink copper was seen in the test tube.

A gas was left the tube during the experiment

Name gas formed and describe how it might be possible to identify the gas

a) Name of gas: . . . . ***carbon dioxide*** . . . . . (1 mark)

b) How the gas could be identified:

. . . . ***Bubble the gas through limewater which will turn milky. .*** . . . . . .(2 marks)

c) Name the chemical that was ***oxidized*** during this experiment:

……***Carbon***…….. (1)

d) Name the chemical that was ***reduced*** during this experiment:

……***copper oxide***…….. (1)

e) Which is more reactive, carbon or copper? ……carbon……..(1)

How do you know the answer above? ……

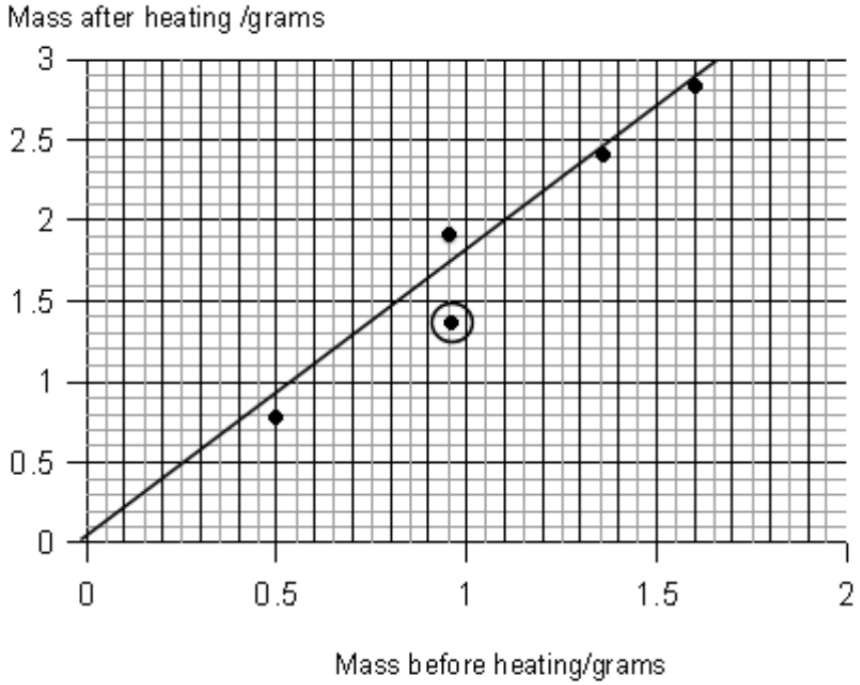
……***because the carbon reduced the copper oxide***…….. (1)

7. A class heated some copper foil over a hot Bunsen flame for five minutes.
The foil was weighed at the start of the experiment and after it had cooled.

Some of the results were as follows:

Copper heated by:	**Mass before heating (grams)**	**Mass after heating (grams**
Alex	0.95	1.70
Chris	0.45	0.80
Jo	1.35	2.40
Pat	0.95	1.35
Sam	1.60	2.85

Plot these results on the grid below: (4 marks)



a) Which result does not fit in with rest.
Suggest a reason why it might be in error .

. ***. .Pat's result. The mass after heating was too low because…***
Some copper may not have been oxidised
Some copper might have been dropped or lost
The balance reading was not accurate .(2)

b) Draw a line through the other 4 points (this is a 'line of best fit' and does not need to go through all the points, but down the middle. (1)

c) Use your graph to find out how much solid would be left after heating one gram of copper

foil. . . . . ***. 1.8g . . . anything between 1.6g and 2.0g . .but depends on the line drawn . . . (2)***

d) Explain *why* the copper foil gained mass during the experiment

. . . . ***The copper combined with oxygen .*** . . . .(2)

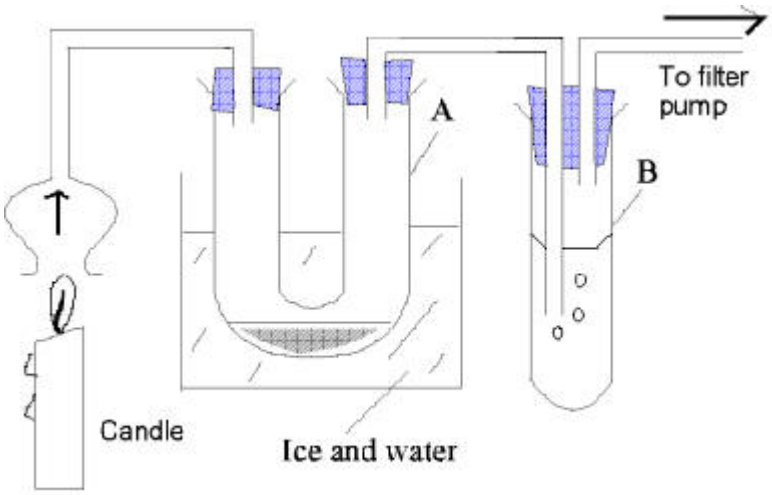
e) What would the gain in mass have been if the boy had started off with 50 grams of copper foil?

. . . . . ***. . 50 x the answer in part c .*** . . . . . (2)

f) Complete the **word equation** for the reaction that takes place when copper is heated in air:

copper + oxygen → copper oxide (2)

8. A pupil set up the following apparatus to investigate the burning of a candle.
   The filter pump sucks the gasses from the candle through the tubes A and B. Tube B contained limewater.



She lit the candle and turned on the pump. After 5 minutes she blew out the flame and turned off the pump.

A colourless liquid collected in the U-tube A.

a) What do you think the liquid was?. . . . . ***water . .*** . . . . . .(1)

b) What was the purpose of the ice and water mixture?

. . . . . ***. . to make the water vapour condense*** . . . . . .(1

c)How would you try to prove that a colourless liquid was pure water?

Measure boiling point : 100°C <u>or</u> see if it turns anhydrous cobalt chloride from blue to pink <u>or</u> if see if it turns anhydrous copper sulphate from white to blue . . . . (3)

During the experiment the liquid in tube B went cloudy.

d) Name the gas that made it go cloudy?. . . ***carbon dioxide*** .(1)

e) From your answers to (a) and (e) above suggest two elements that must be present in candle wax

carbon and hydrogen (2)

f) From the results of this experiment do you conclude that wax is a compound or element? (Give a reason for your answer)

Compound. It must be a compound because it contains two elements, carbon and hydrogen . (2)

9. Peter added some lime (which is a chemical called calcium hydroxide, a white powder) to some water and shook the mixture. A small amount of the lime dissolved, but most did not.

The undissolved lime formed a white suspension.

a) How could you remove the undissolved lime from the mixture?

. . . ***filter the mixture*** . . . . . .(1)

b) How would you try to show that some of the lime *did* dissolve?

. . .***Either: After filtering the mixture put the filtrate into an evaporating basin and evaporate the water. If some lime dissolved there would be a white residue.***

Or: Add some universal indicator to the filtrate and see if it turns blue. . . . . .(2)

c) Why do gardeners sometimes put lime on the soil.

. . . . . ***To neutralise an acid soil*** . . . . (1)

THE END