FORM 2 MID TERM 2 2020
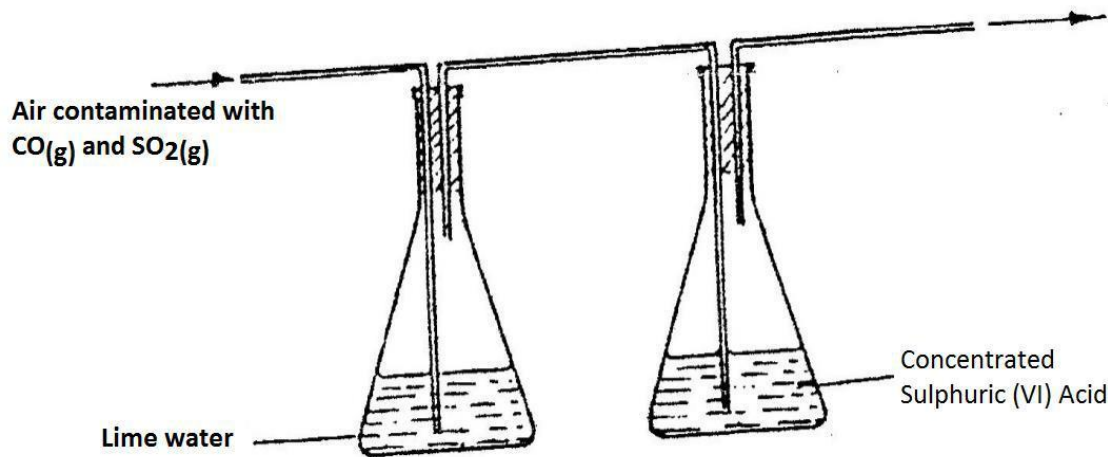
CHEMISTRY

1. Complete the table below for the characteristics of the sub atomic particles.   (2marks)

sub atomic particle	Relative mass	Electrical charge
Proton	1	
Neutral	1	

2. A sample of air contaminated with carbon monoxide and sulphur dioxide was passed through the apparatus shown in the diagram below.

Which contaminant was removed by passing the contaminated air through the apparatus? Explain.

(2mks)

………………………………………………………………………………………………………
………………………………………………………………………………………………………
………………………………………………………………………………………………………

3. Explain how you would obtain solid lead carbonate from a mixture of lead carbonate and sodium carbonate powders.   (3mks)

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

4. Describe how the following reagents can be used to prepare copper (II) hydroxide, solid

………

………

………

………

………

……………………………………………………………………………………………

5. Aluminium metal is a good conductor and is used for overhead cables. State any other two properties that make aluminium suitable for this use.   (2mks)

………………………………………………………………………………………………………

………………………………………………………………………………………………………

………………………………………………………………………………………………………

………………………………………………………………………………………………………

6. State with reasons whether the changes below are physical or chemical.   (3mks)

CHANGE	TYPE OF CHANGE	REASON
b) Heating iodine crystals gently.		
II. Formation of brown coating on iron when exposed to moist air.		
III. Heating Zinc oxide		

7. The table below shows the relative molecular masses and the boiling points of methane and water.

	Relative molecular mass	Boiling point(^{o}C)
Methane	16	-161
Water	18	100

Explain why the boiling point of water is higher than that of methane. (2mks)

....

....

....

....

....

8. (a. Two solutions J and K were tested with blue litmus papers and methyl orange indicator.

Blue litmus remained blue in both solutions. Methyl orange remained orange in K but turned yellow in J.

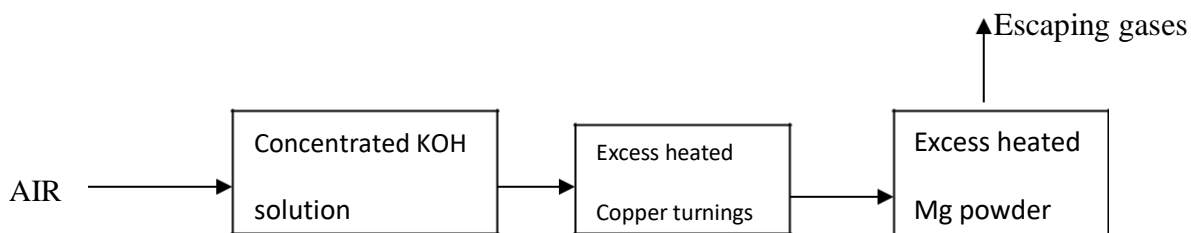(a) What is the nature of substance J? Explain. (2 marks)

(b) Give an example of a substance that K is likely to be. (1mark)--

----

9. Air was passed through several reagents as shown in the flow chart below.

(a)Write an equation for the reaction which takes place in chamber with magnesium powder.(1mk)

....

....

....

(b) Name one gas, which escapes from the chamber containing magnesium powder. Give a reason for your answer.   (2mks)

....

....

....

10. A student set-up the apparatus below in order to determine the percentage by volume of oxygen in air.

AT BEGINING   AT END
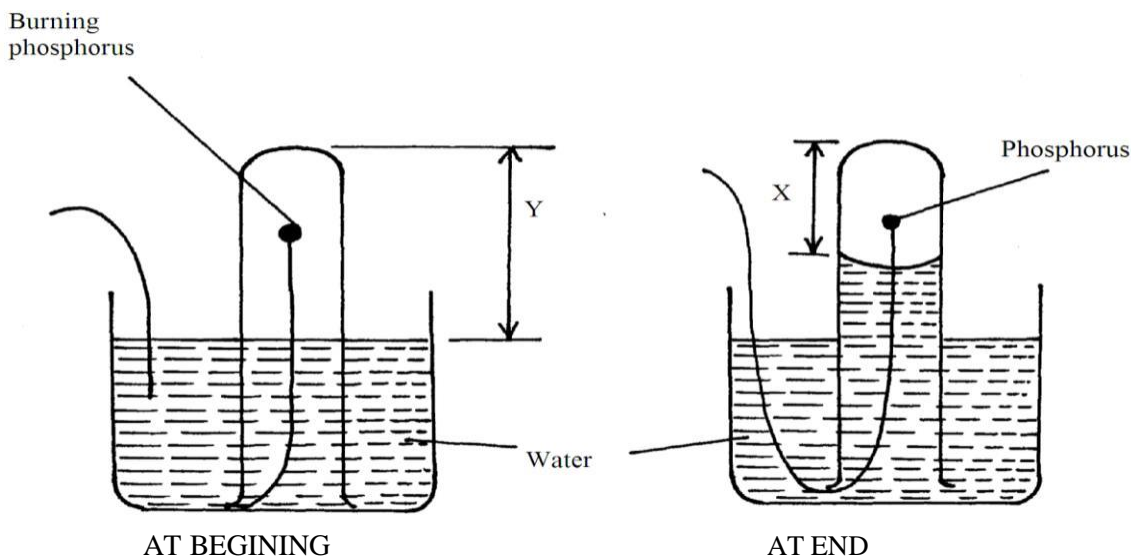
a) Why did water rise when the reaction had stopped?   (1mk)

....

....

b) The student wrote the expression for the percentage by volume of oxygen in air as

$$\frac{y-x}{y} \times 100\%$$

Why was the volume of oxygen calculated using the above expression incorrect? (1mk)

....

....

....

c) What should have been done after the reaction had stopped in order to get a

correct volume.

(1mk)

....

....

....

11. Study the table below.

Ion	Electronic configuration
L^-	2,8,8
M^{2+}	2,8
N^{3+}	2,8,8

(a)   Which elements belong to the same period of the periodic table?   (1 mark)

(b)   What is the formula of the compound formed by L and N.?   (1 mark)

(c)   Compare the atomic and ionic radii of element L.   (1 mark)

----

12. In temperate countries, salt is sprayed on roads to defrost and clear roads but the long term

effect on this practice is costly to motorist.

(a) Explain the role of salt in defrosting the ice.   (1mk)

(b) Explain why the long term effect is costing to motorist.   (1mk)

13. The grid below shows part of a periodic table. The letters do not represent the actual symbols of the elements

a)   Select the:

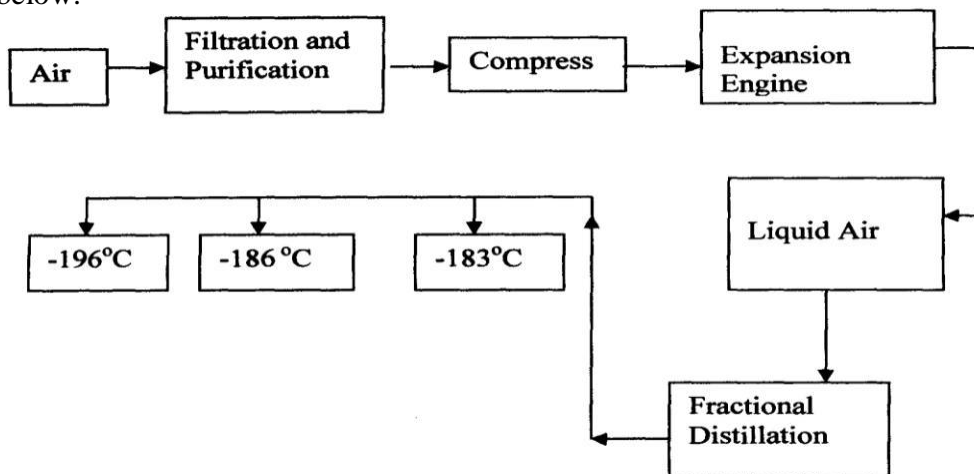(i)   Element which has the largest atomic radius.   (1mk)

………………………………………………………………………………………………………

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

……

b) Show on the grid the position of the element J which forms J^{2-} ions with electronic configuration 2, 8, 8.   (1mk)

14. Oxygen is obtained on large scale by the fractional distillation of air as shown on the flow chart below.

a) Explain why air is considered as a mixture   (1mk)

b) Identify the substance that is removed at the filtration stage   (1mk)

c) Explain why Carbon (IV) oxide and water are removed before liquefaction of air.   (1mk)

d) Identify the component that is collected at -186°C   (1mk)

15. Study the table below and answer the questions that follow:-

Substance		A	B	C	D	E	F
Melting Point (^{o}C)		801	113 OR 119	-39	5	-101	1356
Boiling point (^{o}C)		1410	445	457	54	-36	2860
Electrical	Solid	Poor	Poor	Good	Poor	Poor	Poor
Conductivity	liquid	Good	Poor	Good	Poor	Poor	Poor

Identify with reasons the substances that:
 (i)   Have a metallic structure   (2mks)

(ii)   Have a molecular structure   (2mks)

(iii) Substances A and C conduct electric current in the liquid state. State how the two

substances differ as conductors of electric current   (2mks)

16. Atoms of element X exists as $^{14}_{6}X$ and $^{12}_{6}X$

(a) What name is given to the two types of atoms.   (1mk)

……………………………………………………………………………………………………

(b) Use dot (·) and cross   (x)   diagrams to illustrate the atomic structure of $^{14}_{6}X$ (2mks)

……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………
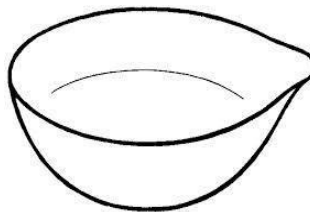……………………………………………………………………………………………………

17. Give 2 reasons why most laboratory apparatus are made of glass.   (1mk)

(b) The diagrams below are some common laboratory apparatus. Name each apparatus and

state its use.   (2mks)

Name   **Name:**

Use   **Use:**

18. Soot is one of the environmental pollutants.

(i) Explain the term pollutant. (1mk)

……

……

(ii) State how soot is formed from hydrocarbons. (1mk)

………………………………………………………………………………………………………

………………………………………………………………………………………………………

………………………………………………………………………………………………………

19. Phosphorus element smoulders in air to form two oxides

(a) Name the two oxides. (2 mks)

(i) _____

(ii) _____

(b) State the nature of the solution when the above mentioned oxides are dissolved in water.

(1mk)

_____

_____

_____

20. (a) What is meant by the terms: (2 mark)

       (i) Atom

_____

_____

       (ii) Mass number

_____

_____

       (b) The formula of element T is TCl_3. What is the formula of its sulphate? (1 mk)

_____

_____

21. Crystals of sodium carbonate decahydrate ($Na_2CO_3 . 10H_2O$) were exposed to air for about four days.

 (i) State what was observed. (1mk)

……………………………………………………………………………………………………

(ii) Name the process that took place. (1mk)

……………………………………………………………………………………………………

 (ii) Write an equation for the reaction that occurred. (1mk)

……………………………………………………………………………………………………
……………………………………………………………………………………………………

22. Explain why molten calcium chloride conducts electricity while silicon (IV) oxide does not.

(2mks)

……………………………………………………………………………………………………
……………………………………………………………………………………………………

23. The table below gives the first ionization energy of three elements

Element	A	B	C
1st ionization energy(kJ/mol)	496	419	520

(i) Define the term first ionization energy. (1mk)

……………………………………………………………………………………………………

……………………………………………………………………………………………………

(ii) Select the element that is the most reactive.   Explain. (2mks)

……………………………………………………………………………………………………

……………………………………………………………………………………………………

……………………………………………………………………………………………………

24. State the colour of the indicators in the solutions given in the table below: (3mks)

	Colour in	
Indicator	**Acid**	**Base**
Litmus	Red	
Methyl orange		Yellow
Phenolphthalein	Colourless	