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is the study of the structure, properties and composition of matter and the changes that matter undergoes.

(b) state three roles of chemistry in the society. (3mrks)

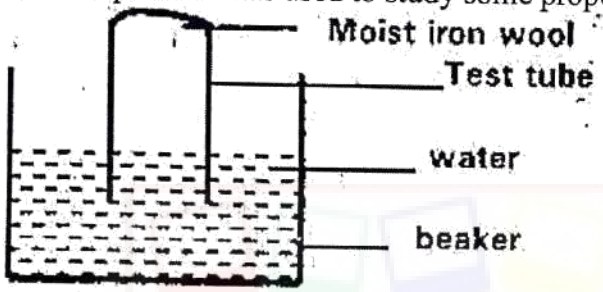
- 1) production of food to fight hunger.
- 2) manufacture of cheaper alternative fabric eg nylon.
- 3) manufacture of Detergent
- 4)

2. Putting out flames after use is one of the laboratory rules, state three other laboratory rules. (3mrks)

- Do not eat or drink in the lab.
- Doors and windows should be opened.
- label all chemicals to avoid confusion.
- any other correct.

3. List two differences between temporary physical change and permanent chemical change. (2mrks)

4. The set up below was used to study some properties of air



State and explain two observations that would be made at the end of the experiment. (4mks)

- (i) iron wool turns yellow. This is due to the moisture in iron wool combining with oxygen to form hydrated iron(III) oxide.
- (ii) The level of water in the inverted test tube rise to occupy the space left by oxygen.

5. The table below gives information about ions of P and Y

Ion	P <sup>+</sup>	Y <sup>2-</sup>
Electron arrangement	2.8	2.8.8
Number of Neutrons	12	16

a) Write the electron configuration for the atom of **Y** (1mk)

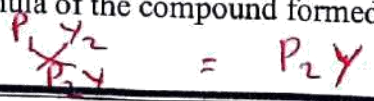
2.8.6

b) How many protons are there in the nucleus of (2mks)

(i) P 9

(ii) Y 16

(c) Write the formula of the compound formed when P and Y reacts (2mks)



6. Diamond and graphite are allotropes of carbon.

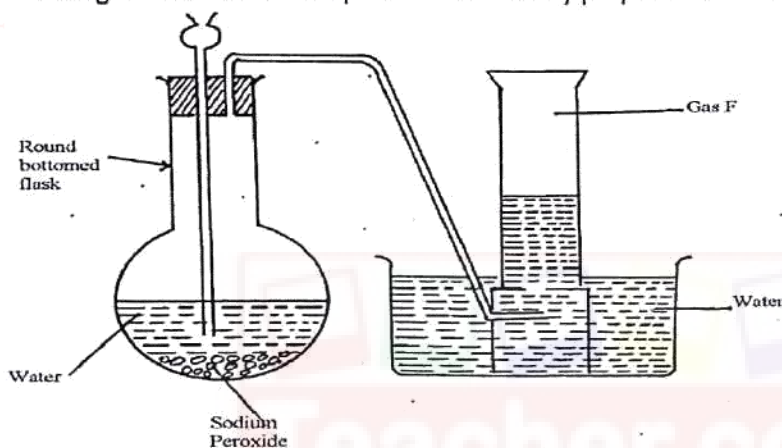
(i) What are allotropes? (1mk)

*Different forms of an element in the same physical state.*

(ii) In terms of structure and bonding explain why diamond is used in drilling through hard rocks while graphite is a lubricant (2mks)

*The carbon atoms in diamond uses all its four electrons to form covalent bonds with each other while in graphite the carbon atoms are bonded covalently but the molecules are linked by weak but van der Waals forces giving it its slippery feel*

7. The diagram below is a set up for the laboratory preparation of oxygen gas.



(i) Name gas F

(1mk)

*Oxygen.*

(ii) At the end of the experiment, the solution in the round bottomed flask was found to be a strong base. Explain why this was so (2mks)

*Sodium peroxide reacted with water to form sodium hydroxide.*

(iii) Which property of gas F makes it be collected by the method used in the set-up? (1mk)

*It is slightly soluble in water.*

(iv) Give one industrial use of gas F (1mk)

*use as a fuel in fuel cells.  
used in hospitals for patients with breathing difficulty.*

*Any other correct*

8. Oxygen exists naturally as isotopes of mass number 16, 17 and 18 in the ratio 96:2:2 respectively. Calculate its R.A.M. (3 mks)

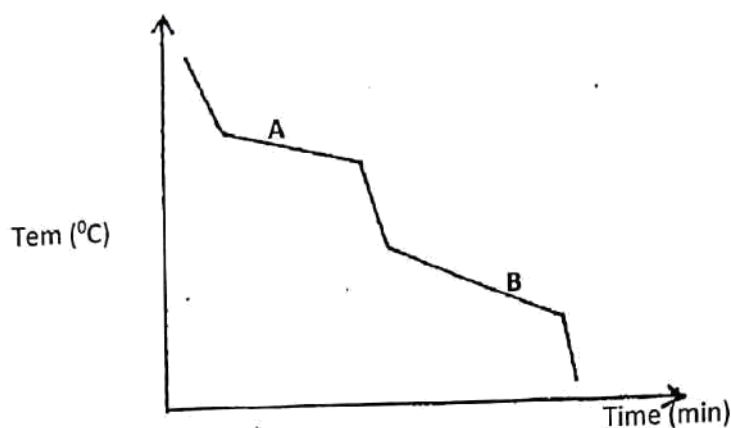
$$\frac{16 \times 96}{100} + \frac{17 \times 2}{100} + \frac{18 \times 2}{100}$$

$$15.36 + 0.34 + 0.36 = \text{RAM} = 19.72$$

9. The grid given below represents part of the periodic table. Study it and answer the questions that follow. The letters are not the actual symbols of the elements.

**CHEMISTRY FORM 2 MARKING SCHEME**

10. The following is a cooling curve of a certain substance.



(a) Is this a pure or impure substance? Explain

(2mrks)

*Impure: Change of state occurs at a range of temperatures.*

(b) Explain using kinetic theory what happens in region A

(2mrks)

*Particles of the substance are losing kinetic energy and come closer to one another thus developing stronger interparticle force of attraction.*

11. The following is a list of pH values of some substance:

Substance	M	N	V	X	Z
pH	10.6	7.2	13.2	5.9	1.5

Identify:

(i) Strong acid *Z*

(1mrk)

(ii) Weak base *M*

(1mrk)

12. Briefly explain the following:

(a) Alkaline earth metals are generally less reactive than-alkali metals.

(2mrks)

*Alkaline earth metals have stronger nuclear force than alkali metals thus are less reactive.*

(b) Though sodium and aluminum are in the same period and are both metals, aluminum is a better conductor of electricity.

(2mrks)

*Aluminium has more delocalised ~~structure~~ electrons in its metallic structure thus making it a better conductor than ~~is~~ sodium.*

**CHEMISTRY FORM 2 MARKING SCHEME**

B,		G,	H	E	
	J	I	L	N	C
D				M	
Y					

(i) What name is given to the family of elements to which A and C belong? (1 mrk)

*Noble gas*

(ii) Write the chemical formula of the sulphate of element D. (1 mrk)

*D<sub>2</sub>SO<sub>4</sub>*

(iii) Which letter represents the most reactive (2mrks)

(a) Metal *Y*

(b) Non-metal *E*

(iv) Select one element that belongs to period 4. (1mrk)

*D & M*

(v) Explain why the Ionic radius of element E is bigger than the atomic radius. (2mrks)

*Element E reach by gaining an electron thus increasing its radius due to the repulsion between electrons.*

(vi) The electron configuration of a divalent anion of element N is 2.8.8. Indicate the position of element N on the periodic table drawn above. (1mrk)

(vii) How do the atomic radii of I and C compare. Explain. (2mrks)

*I has a larger atomic radius than C because atomic radius decreases across a period.*

(viii) Explain the trend in the 1<sup>st</sup> ionization energies of the elements J, I and L. (1mrk)

*1<sup>st</sup> ionization energy increases from J to L due to increase in nuclear charge.*

**CHEMISTRY FORM 2 MARKING SCHEME**

13. Two papers A and B were placed at different levels of a non-luminous flame. Paper A was placed at the lowest part of the flame while B was placed at the tip.

- (a) Indicate **below** the observations made on each paper. (2mrks)



Paper A

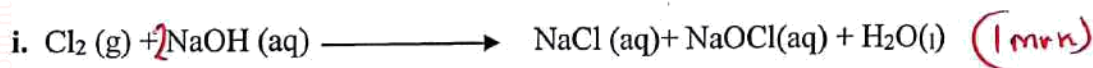


Paper B

- (b) Explain the observations made on paper A. (1mrk)

*There was an unburnt central part on the paper because this part was placed in the almost colourless zone of the flame which contains unburnt gases.*

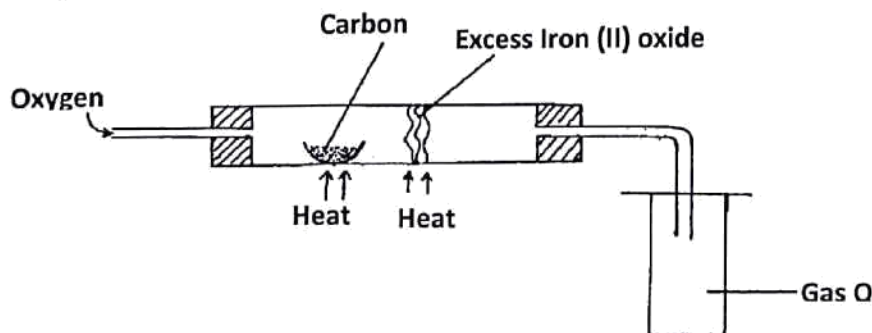
14. Balance the following equations. (4mrks)



15. You are provided with water, lead carbonate, dilute nitric (V) acid and solid sodium chloride. Describe in very clear steps how you would prepare a sample of lead chloride. (3 mrks)

*React  $\text{PbCO}_3$  and Nitric acid to form  $\text{Pb(NO}_3)_2$  aq  
React  $\text{Pb(NO}_3)_2$  with  $\text{NaCl}$  aq to form a precipitate of  $\text{PbCl}_2$ .  
Filter and dry the precipitate between filter papers*

16. The set up below was used to obtain a sample of iron.



- i) Write two equations for the reaction which occur in the combustion tube. (2mks)

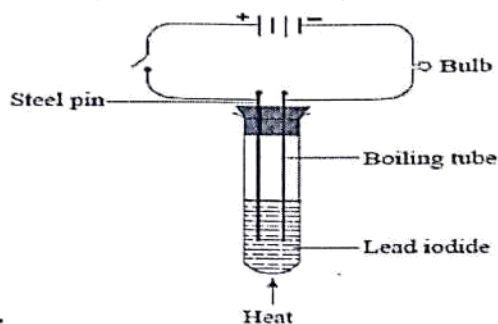


ii) Identify gas Q

(1mrk)

Carbon (IV) oxide

17. The diagram below shows a set up which was used by a student to investigate the effect of electricity on



molten lead (II) iodide.



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