

NAME.....ADM NO.

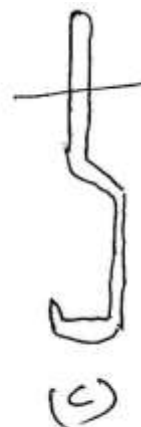
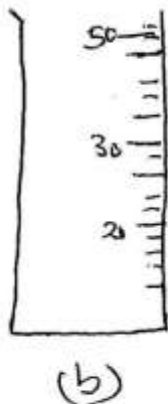
ANSWER ALL THE QUESTIONS IN THE SPACES PROVIDED

1. Define the following:

a) Element (1mk)

b) Ion (1mk)

2. i) Identify the following apparatus and give a use for each (3mks)



a)Use.....

b)Use.....

c)Use.....

ii) Name another apparatus that can be used in place of (b) (1mk)

3. Give four reasons why most apparatus are made of glass
(4mks)

4. Define the following terms

a) Isotope

(1mk)

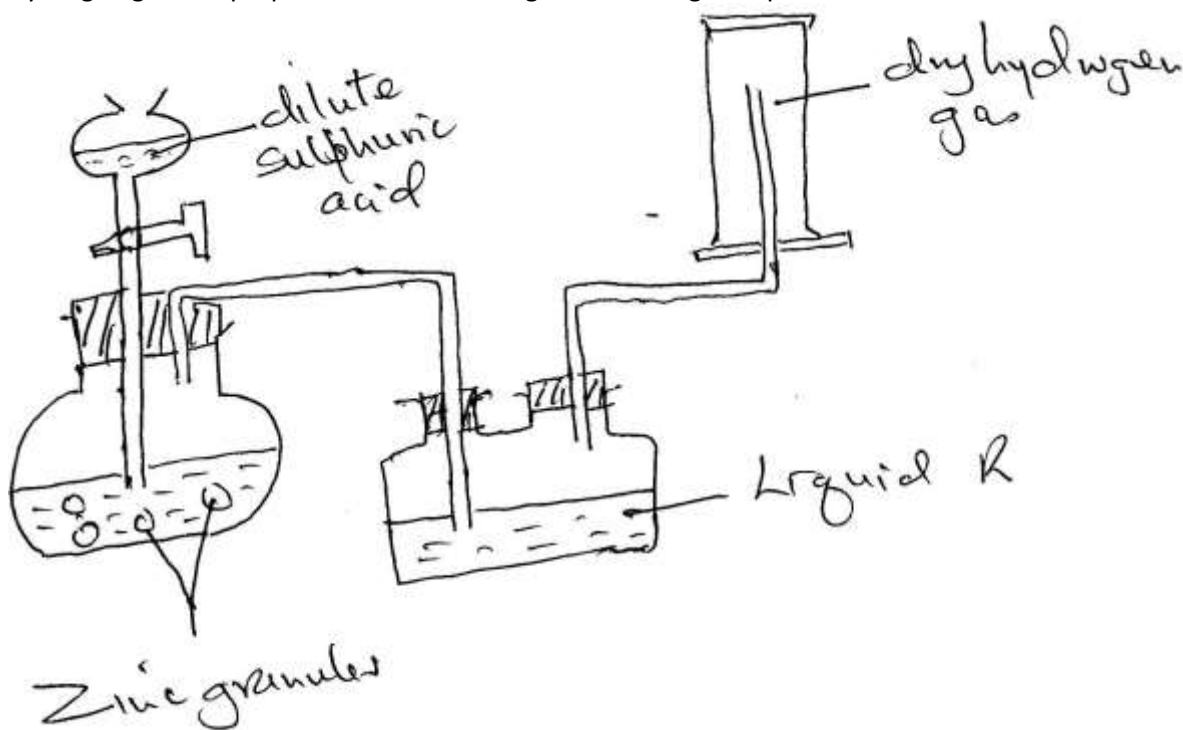
b) Ionization energy

(1mk)

c) Electron affinity

(1mk)

5. Hydrogen gas was prepared in the lab. Using the following set up



a) Write an equation for the reaction taking place and balance it

(2mks)

b) Name the method used to collect the gas and give a property of hydrogen that enables it to be collected through the method. (2mks)

c) Name liquid R and state its function in the set up (2mks)

Liquid R:

Function:.....

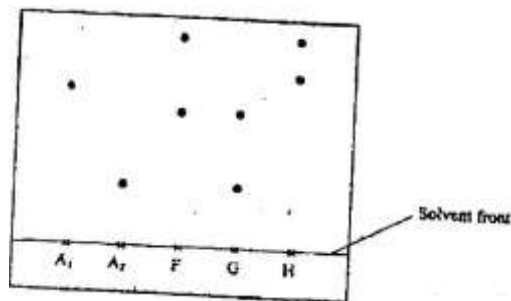
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d) Explain why it is not advisable to use sodium metal in place of zinc metal (2mks)

e) State two uses of hydrogen gas (2mks)

f) What will happen to the pH of the solution in the beaker after one day? Give an explanation. (2mks)

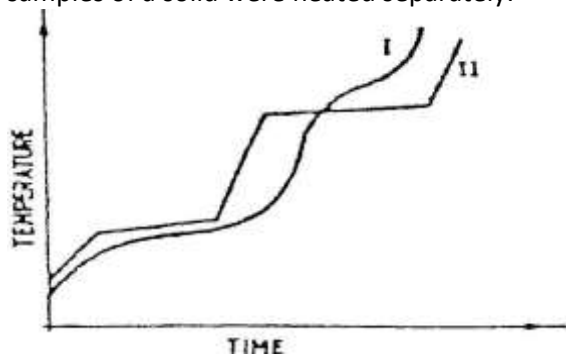
6. Samples of urine from three participants F, G and H at an international sports meeting were spotted onto a chromatography paper alongside two from illegal drugs A1 and A2. A chromatogram was run using methanol. The figure below shows the chromatogram.



a) Identify the athlete who had used an illegal drug (1mk)

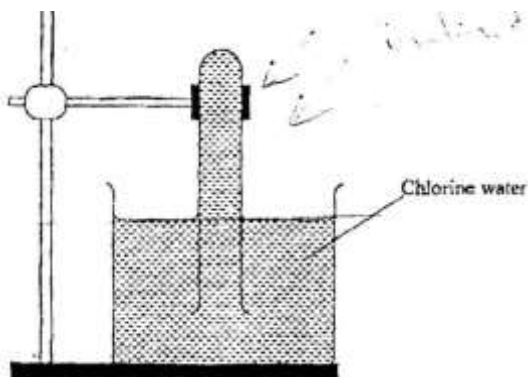
b) Which drug is more soluble in methanol? (1mk)

7. The curve below represents the variation of temperature with time when pure and impure samples of a solid were heated separately.



Which curve shows the variation in temperature for the pure solid? Explain. (2mks)

8. In an experiment, a test-tube full of chlorine water was inverted in chlorine water as shown in the diagram below and the set up left in sunlight for one day.



After one day, a gas was found to have collected in the test-tube

a) Identify the gas (1mks)

b) How can the above gas be tested? (2mks)

9. The table below shows some properties and electronic arrangements of common ions of elements represented by letters P to X. Study the information in the table and answer the questions that follow

Element	Ion	Electron arrangement	Atomic radius	Ionic radius
P	P^{2+}	2,8,8	0.197	0.099
Q	Q^-	2,8	0.072	0.136
R	R^+	2,8,8	0.231	0.133
S	S^{3+}	2,8	0.143	0.050
T	T^{2+}	2,8,8	0.133	0.074
U	U^{2+}	2,8	0.160	0.065
V	V^+	2,8	0.186	0.095
W	W^+	2	0.152	0.060
X	X^-	2,8,8	0.099	0.181

i.) Give the atomic numbers of the elements P and Q (2mks)

P -

Q –

- ii.) Select the most reactive metallic element (1mk)

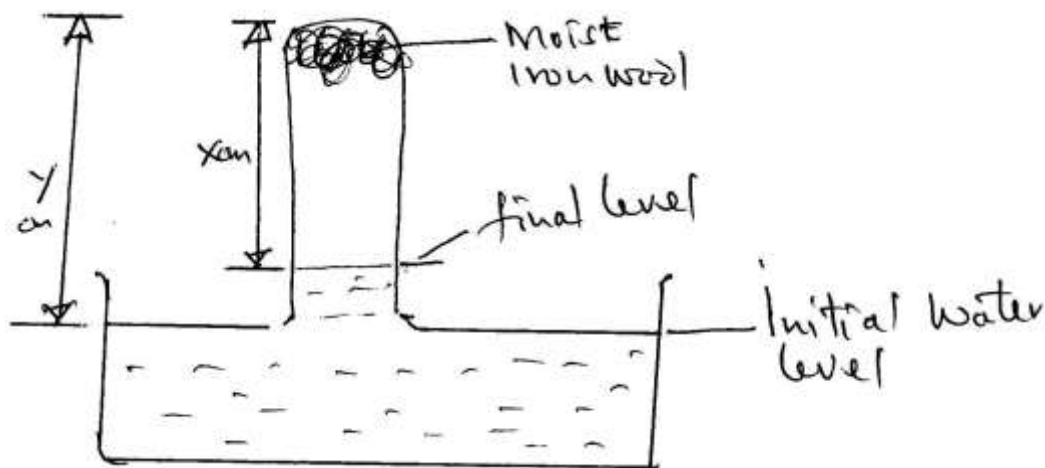
- iii.) Select 3 elements that belong to the same group of periodic table (2mks)

- iv.) Select 3 elements that would react with cold water to evolve hydrogen gas (1mk)

- v.) Why is the ionic radius of element X larger than its atomic radius? (1mk)

- vi.) Write an equation of the reaction between element S and Oxygen (2mks)

10. Moist iron wool was inverted over water. The set up was left to stand for 2 days



a) Explain whether rusting is a physical or chemical reaction (2mks)

b) Write an expression using X and Y to show the percentage of Oxygen (2mks)

c) What would be the effect of using a larger piece of iron wool? Explain. (2mks)

d) State two similarities between rusting and combustion (2mks)

11. Observe the equation below



i) Balance the equation (1mk)

- ii) Select the following from the above equation
Oxidizing agent (1mk)
- Reducing agent (1mk)
- iii) State two situations where redox reactions are applied in industry (2mks)
12. Carbon (IV) sublimes at -78°C . It is called dry ice
- a) Why is it called dry ice? (1mk)
- b) It is used for keeping ice cream cold. Why is it preferred to ordinary ice? (2mks)
- c) Name two other substances that behave as dry ice (2mks)
- d) Give an industrial application of sublimation (1mk)
13. a) Element X has two isotopes. Two thirds of ${}^{33}_{16}\text{X}$ and one-third ${}^{30}_{16}\text{X}$. What is the relative mass of element X?
- b) An element, A, has 30 protons and 35 neutrons. What is (2mks)
- i) The mass number of element A?

- ii) The charge on the most stable ion of element A?
- c) An element B consists of three isotopes of mass, 28, 29 and 30 and percentage abundances of 92.2, 4.7 and 3.1 respectively. Show that the relative atomic mass of element is 28.11 (4mks)
- d) Elements X and Y have atomic numbers 11 and 17 respectively. Which one of the elements is a metal? Give a reason for your answer. (2mks)

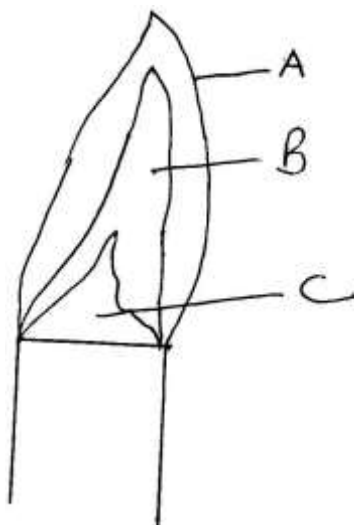
- e) The table below shows the atomic numbers of four elements W,X,Y and Z

Element	W	X	Y	Z
Atomic number	20	17	19	9

Which two elements belong to the same group?
(2mks)

- f) Two elements M and N have atomic numbers 17 and 20 respectively. Write the formula of the compound formed when M and N react.
(1mk)

14. The following diagram represents a non-luminous flame of the Bunsen burner



- a) Name the parts of the flame labeled A, B and C (3mks)
- b) Which of the parts in (a) above is the hottest? (1mk)
- c) A non-luminous flame is preferred for heating. Explain (2mks)
- d) i) Name the other type of flame produced by a Bunsen burner (1mk)
- ii) Under what conditions does the Bunsen burner produce the flame in d(i)? (1mk)
- e) Define the following terms as used in medicine
- i) Drug (1mk)
- ii) Prescription (1mk)

iii) Dosage (1mk)

iv) Drug abuse (1mk)

15. Balance the following chemical equations

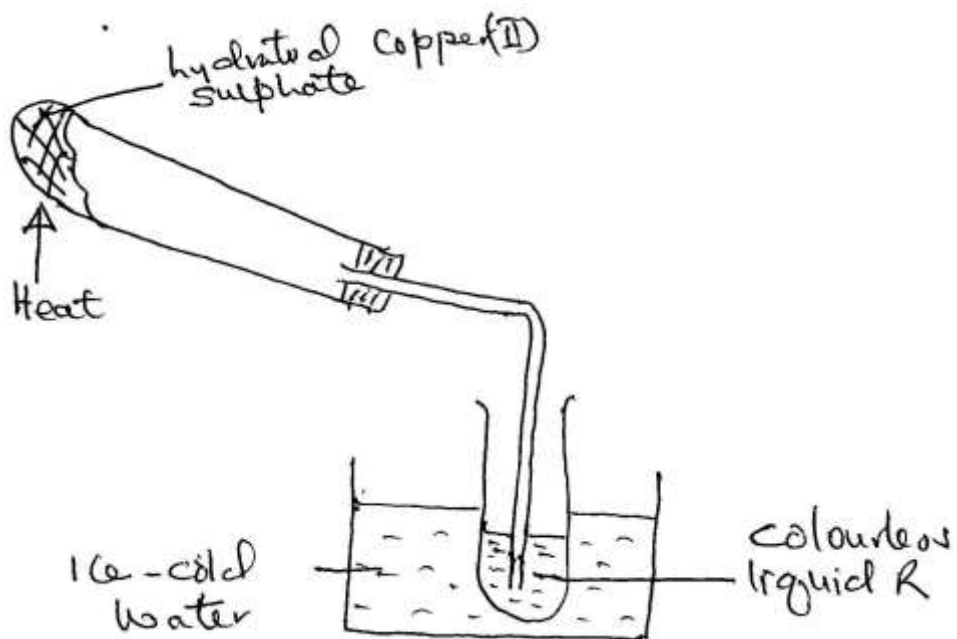
i) $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$ (1mk)

ii) $\text{Mg} + \text{N}_2 \rightarrow \text{Mg}_3\text{N}_2$ (1mk)

iii) $\text{Al} + \text{HCl} \rightarrow \text{AlCl}_3 + \text{H}_2$ (1mk)

iv) $\text{C}_3\text{H}_8 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ (1mk)

16. Hydrated Copper (II) Sulphate is heated in a boiling tube as shown.



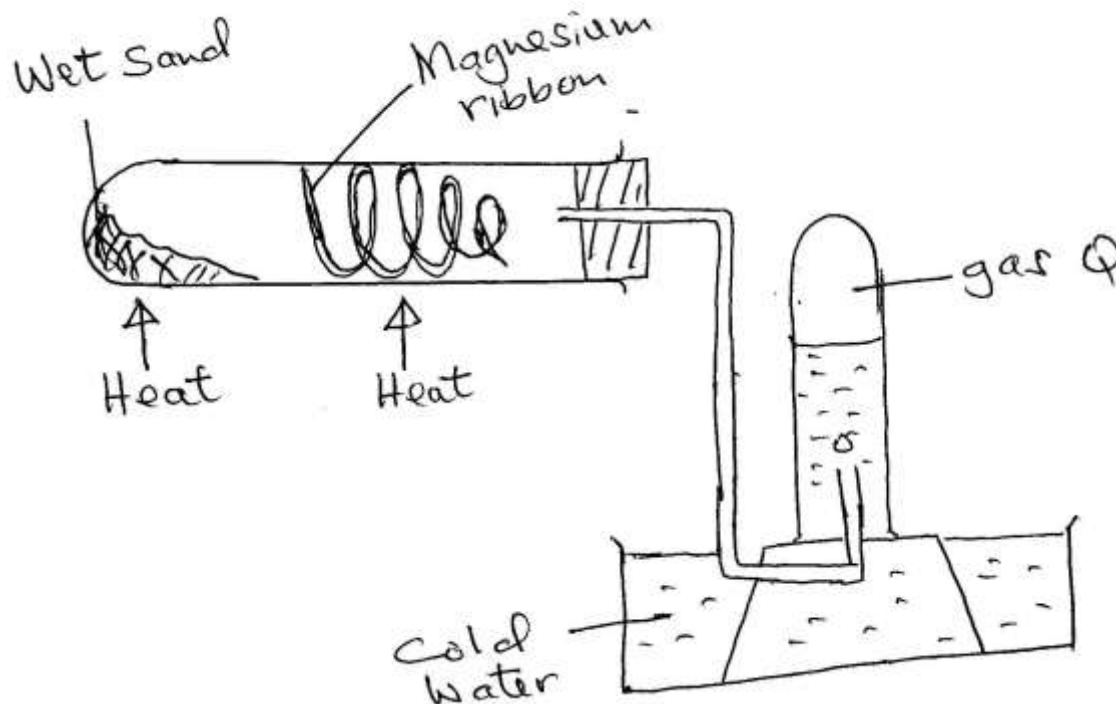
- i) State the colour of Copper (II) Sulphate before and after heating? (1mk)

- ii) Explain why the boiling tube was slanted (1mk)

- iii) How can the purity of the colourless liquid be confirmed? (1mk)

- iv) Name another substance that can undergo the same change as hydrated Copper (II) Sulphate (1mk)

17. A Magnesium ribbon was cleaned with steel wool and used in the following set up. Wet sand was heated before Magnesium ribbon.



- a) Explain the following:
 - i) Sand was heated first before heating Magnesium ribbon (1mk)

 - ii) Magnesium ribbon was cleaned with steel wool (1mk)

- b) Name gas R (1mk)

- c) Write an equation for the reaction taking place in the combustion tube (1mk)

- d) Name the method used to collect gas R (1mk)