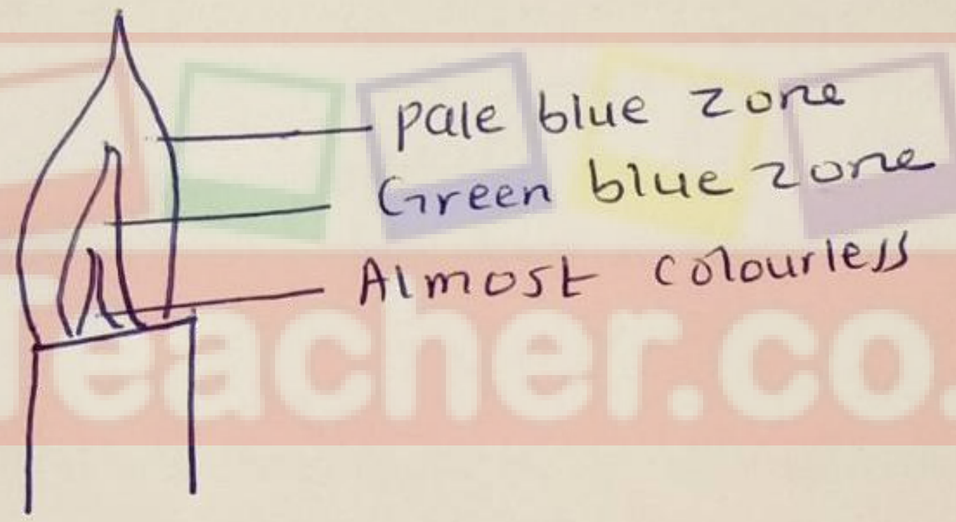
INSTRUCTIONS

ATTEMPT ALL QUESTIONS.

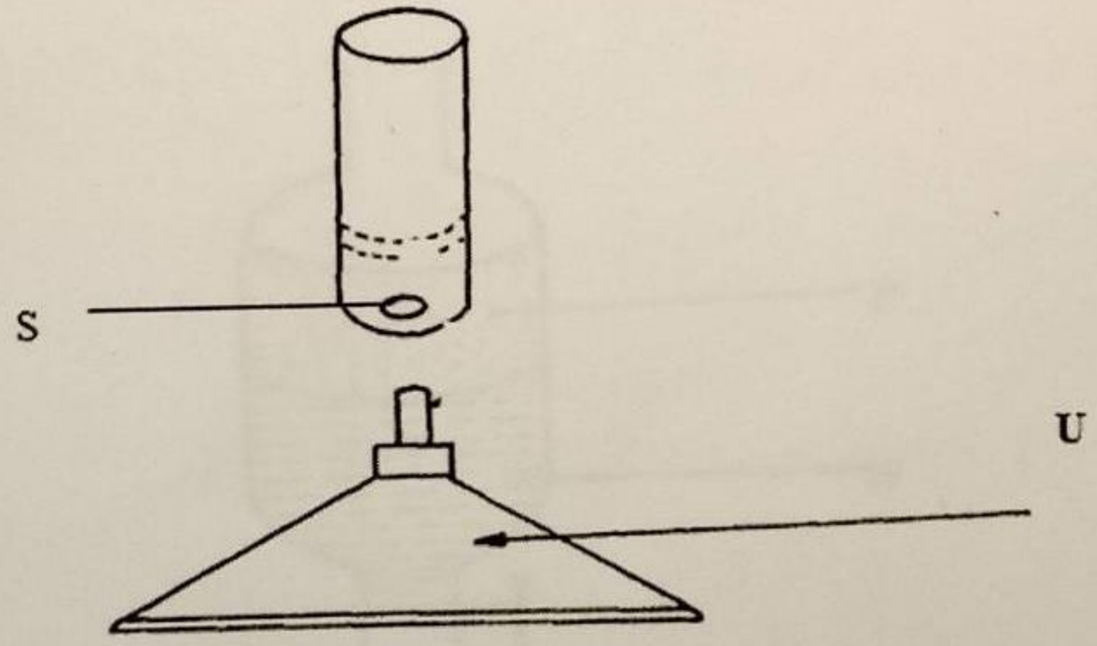
1. (a) When the air-hole is fully opened, the bunsen burner produces a non-luminous flar
Explain ( 1 mark)

There is complete combustion of gases

(b) Draw a labelled diagram of a non-luminous flame. ( 3 marks)




2. The diagram below shows some parts of a Bunsen burner



Name parts S and U and state their functions. ( 4 marks)

S - Air hole

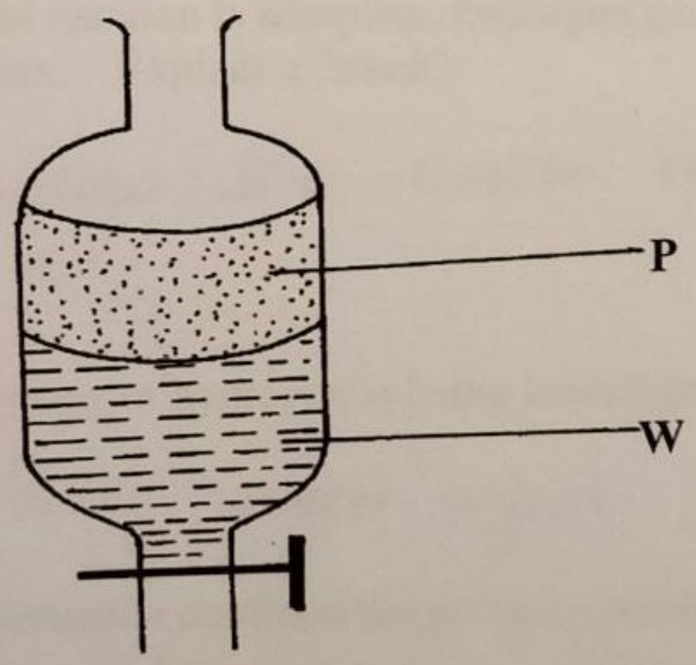
It allow air to the chimney

U - Base

It offers the support.

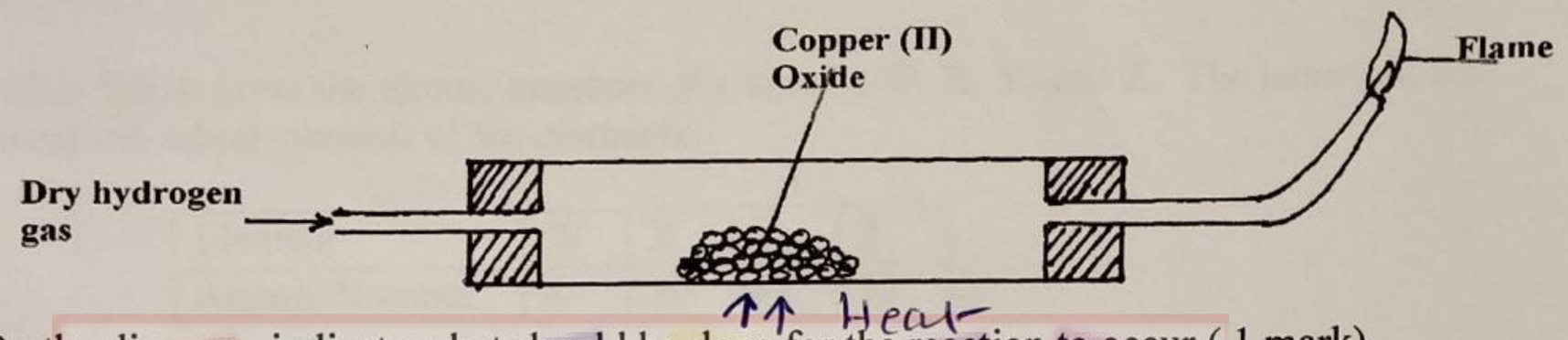


3. A mixture of hexane and water was shaken and left to separate as shown in the diagram below:




Name the above method of separation. 1 mark

4. The set-up below is used to investigate the properties of hydrogen.




i) On the diagram, indicate what should be done for the reaction to occur ( 1 mark)

ii) Hydrogen gas is allowed to pass through the tube for some time before it is lit. Explain ( 2mark)

To drive out air, because when hydrogen and air mixes, when lit, explosion can occur.

iii) Write a chemical equation for the reaction that occurs in the combustion tube. ( 1 mark)

$CuO_{(s)} + H_{2(g)} \longrightarrow Cu_{(s)} + H_2O_{(g)}$

iv) When the reaction is complete, hydrogen gas is passed through the apparatus until they cool down . Explain ( 2mark)

To allow the copper to cool to prevent oxidation by air.

v) What property of hydrogen is being investigated? ( 1 mark)

Reducing ~~paper~~ agent.

vi) What observation confirms the property stated in (v) above? ( 2mark)

Black copper (II) oxide turns to brown copper.

5. Explain why an atom is said to be electrically neutral. ( 2 marks)

The number of protons are equal to the num
electrons

6. The table below gives the atomic numbers of elements **W, X, Y,** and **Z.** The letters do not represent the actual symbols of the elements.

| Element | W | X | Y | Z |
|---|---|---|---|---|
| Atomic Number | 4 | 10 | 11 | 12 |

a) Which one of the elements is least reactive? Explain. (1mark)

X it is stable

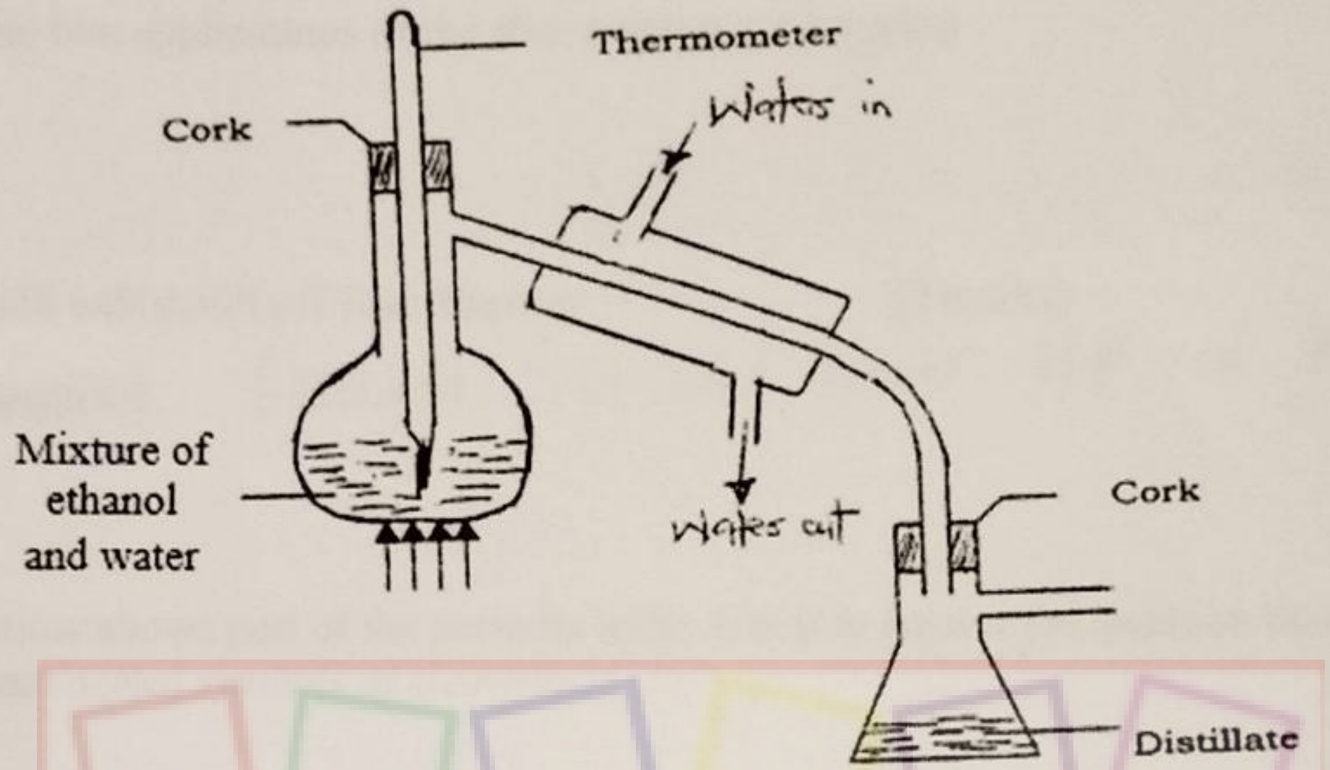
b)i) Which two elements belong to the same group? (1mark)

W and Z

ii) Give the formula of the Z sulphate. (1mark)

$ZSO_4$

7. In an experiment to separate a mixture of ethanol and water. Ethanol boils at $78^0$C and water $100^o$C. A student set up the apparatus shown below.






a) Identify two mistakes in the set – up. (2marks)

-> The thermometer has dipped inside the mixture.

-> Water in and out is wrongly placed. inverted.

b) What method would the student use to test the purity of the distillates obtained? (1mark)

Determine boiling point, melting point, density

c)Name the above method of separation. (1mark)

d)State the two applications of the above process. (2 marks)

e. Which liquid will distill off first. Explain. (2 marks)

~~Kerosene~~ Ethanol it has lower b.p of 78°C.

8.The grid below shows part of the periodic table. Use it to answer the question that follows.
*(Letters are not actual symbols of elements.)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| P | | | | | | | | |
| | M | | | | | E | F | |
| G | W | | H | I | | | J | K |
| Q | L | | | | | | | |

a) Write the electronics configuration of the following element. (2mk)

i. E

2.6

ii. L

2.8.8.2

b) Give the formula of one stable ion with an electron arrangement of 2:8 which is;

(2mark)

i. Negatively charged.

$E^{2-}$, $F^-$

ii. Positively charged

$G^+$, $W^{2+}$, $H^{3+}$

c) Select two alkali metals from the above periodic table (2 mark)

G and Q

d) Compare the atomic radius of G and Q, give a reason. (2mark)

e) Write the chemical equation between W and oxygen. ( 1 mark)

WO

f) (i). State three observations made when a piece of element G is placed on water, (3marks)

① Floats on water.
② Melts into a silvery ball
③ Hissing sound is produced.

(ii). Write a chemical equation between element G and water. (2mark)

$G_{(s)} + H_2O_{(l)} \longrightarrow GOH_{(aq)} + H_{2(g)}$

8. (a) What is meant by the terms?

i. Atom; (2mk)

It is the smallest particle of an element that can take part in achemical reaction.

ii. Isotopes? (2mk)

Atoms of the same element with the same atomic number but different mass number.

(b) The formula for a sulphate of titanium is $Ti_2(SO_4)_3$. Write the formula of its chloride?

(1mk)

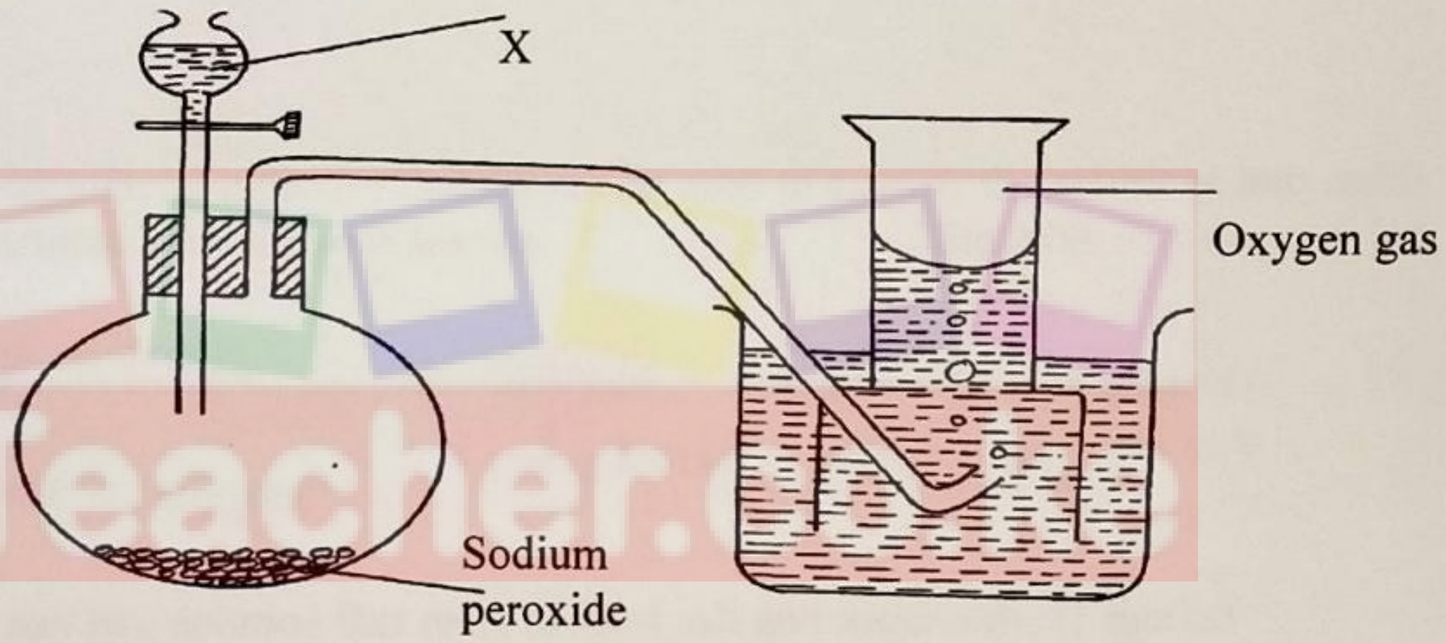
TiCl

(c) Calculate the relative atomic mass of Neon given that it exist as;
90.92% $^{20}_{10}Ne$ , 0.26% $^{21}_{10}Ne$ , 8.82% $^{22}_{10}Ne$, ( 3 marks)

$$R.A.M = \frac{90.92 \times 20 + 0.26 \times 21 + 8.82 \times 22}{100}$$

$$= 2017.9$$

9. The diagram below shows students set-up for the preparation and collection of oxygen gas




(a) Name substance **X** used ( 1 mark)

Water

(b) Write an equation to show the reaction of sodium peroxide with the substance named in **1(a)** **(1 mark)**

~~NaOH + $H_2O$~~ $2Na_2O_{2(s)} + H_2O_{(l)} \longrightarrow 4NaOH_{(aq)} + O_{2(g)}$

**( c)**state 3 uses of oxygen gas. ( 3 marks)

- Oxygen mixed with hydrogen or acetylene used in welding.
- Oxyen is used in hospital with patients with breathing problems.
-

(d) Name the method of collection shown above ,explain. ( 2marks)

over water, it is slightly soluble in water / insoluble in water.

10. The following table shows solutions with their pH values. Use it to answer the questions that follow.

| pH | 1 | 7 | 14 | 9 | 5 |
|---|---|---|---|---|---|

i. Identify a solution which ( 2marks)
strong acid A

strong base. C

ii. Which solution is used in the manufacture of anti acid tablets (1 marks)

D

iii. State a commercial indicator that cannot be used to classify the solutions into, acids, base or neutral. Explain your answer. ( 2marks)

Methyl orange It show distinct colour in acid & base and indicator.

Litmus paper

iv. Identify any two solution that react to form salt and water only. (1 marks)

A and B
A and D
D and E Any
C and E