**NAME……………………………………………… ADM NO……………… CLASS……………………….**

**MWAKICAN EXAMINATION-TERM 3-2019.**

**CHEMISTRY.**

**FORM 2.**

**TIME: 2 HOURS.**

**INSTRUCTION TO CANDIDATES**

Answer all the questions in the spaces provided.

**FOR EXAMINERS USE ONLY.**

|  |  |  |
| --- | --- | --- |
| **QUESTIONS.** | **MAXIMUM SCORE.** | **CANDIDATE SCORE.** |
| **1-28.** | **100** |  |

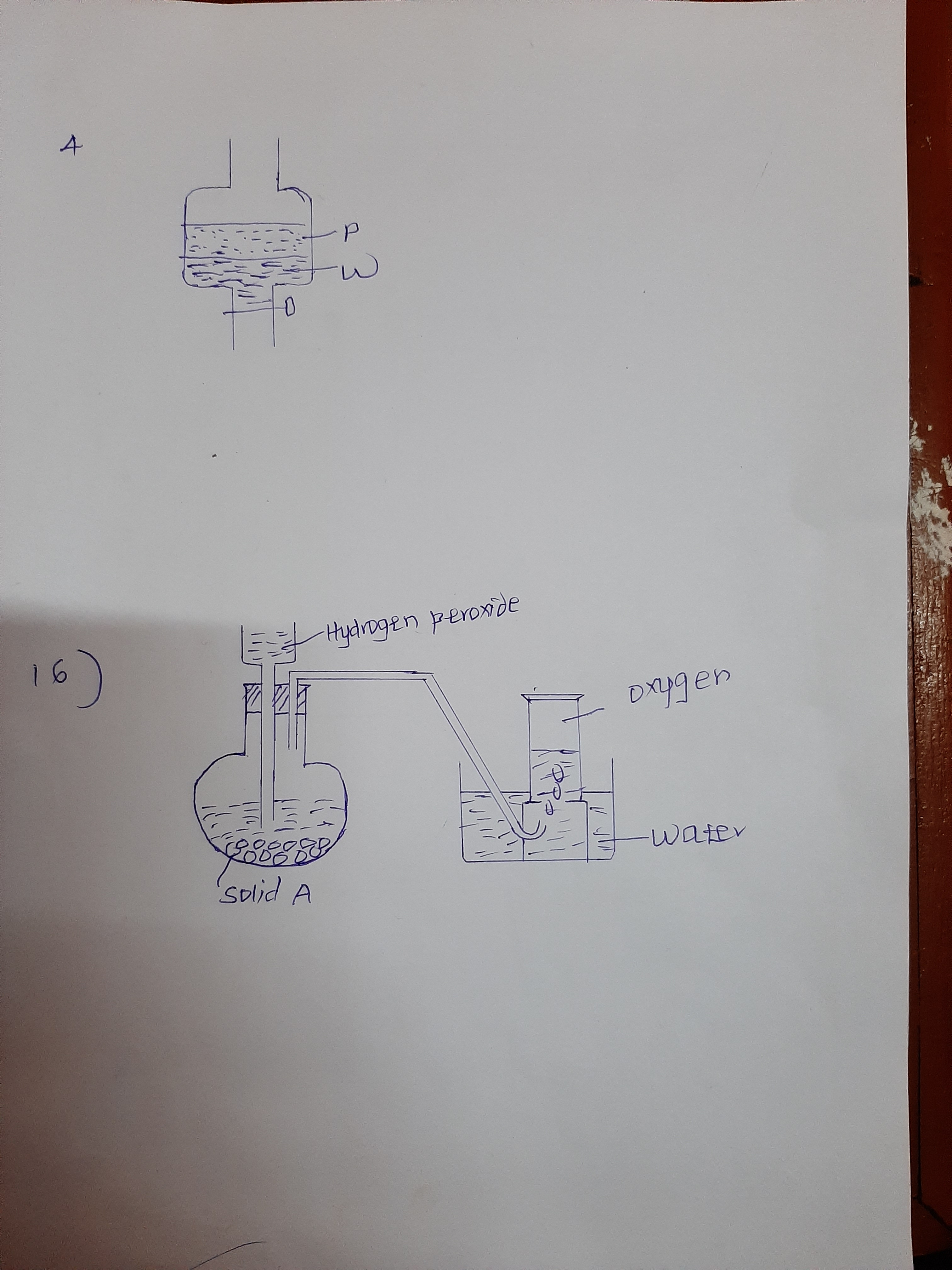
1. State two differences between luminous and non-luminous flames (2mks)

|  |  |
| --- | --- |
| **Luminous** | **Non-luminous** |
|  |  |

1. Name the best method that can be used to separate the following mixtures (3mks)
2. Sand and Water
3. Ethanol and Water
4. Sodium Chloride and Ammonium Chloride
5. Study the table below and use it to answer the questions that follow. (the letters do not represent the actual symbols of the elements.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ELEMENT | A | B | C | D | E |
| ATOMIC NUMBER | 5 | 20 | 3 | 18 | 5 |
| MASS NUMBER | 10 | 40 | 7 | 40 | 11 |

1. Select two letters that represent the same element .Give a reason. (2mks)
2. Give the number of neutrons in an atom of element D. (1mk)
3. Identify an element that is unreactive. (1mk)
4. Write the electron arrangement of B. (1mk)
5. A mixture of kerosene and water was shaken and left to separate as shown in the diagram below.



State the identity of; (2mks)

1. P
2. W
3. (a)Complete and balance the following reaction. (1mk)

**Zn(s) + HCl(aq)**

(b) State two uses of hydrogen gas. (2mks)

(c)Give a reason why nitric (V) acid is not used in the laboratory preparation of hydrogen gas.

(1mk)

6.(a)What are Isotopes?

(1mk)

(b) The table below shows the relative atomic masses and percentage abundance of the isotopes M1 and M2 of element M.

|  |  |  |
| --- | --- | --- |
| ISOTOPES | RELATIVE ATOMIC MASS | % ABUNDANCE |
| M1 | 60.57 | 59.71 |
| M2 | 62.83 | 40.29 |

Calculate the relative atomic mass of element M

(3mks)

7..The structure of an ammonium ion is shown above.

**H +**

**N**

**H H**

**H**

Name the type of bond represented in the diagram by: (2mks)

1. N H
2. N H
3. When calcium granules are mixed with dilute sulphuric acid, a reaction is observed which soon stops. Explain giving the relevant equation. (2mks)
4. Below are pH values of some solutions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SOLUTION | P | Q | R | S |
| PH | 6.2 | 13 | 2 | 7 |

1. Which solution is likely to be;
2. Acidic rain (1mk)
3. Sodium Chloride (1mk)
4. Dilute sulphuric VI acid (1mk)
5. Sodium hydroxide acid (1mk)
6. Dry carbon (II) Oxide gas reacts with heated copper (II) oxide as shown in the equation below.

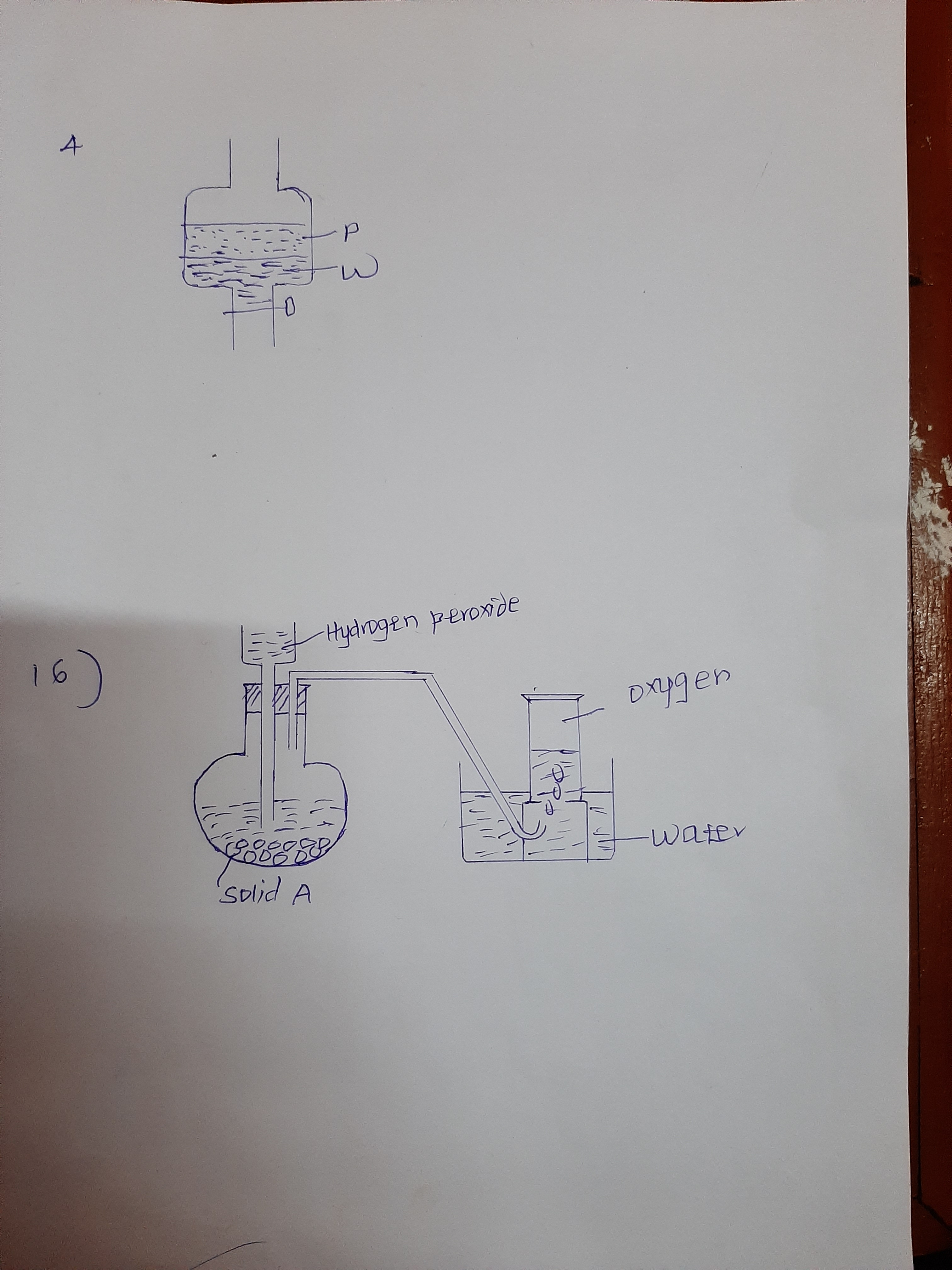
CuO(S) + CO(g)(S) L) Cu(s)+CO2(g)

1. Name theprocess undergone by Copper (II) Oxide. Explain. (2mks)
2. Name another gas that can be used to perform the same function as carbon (II) oxide gas in the above reaction . (1mk)
3. In the very cold countries, salts are sprinkled on the roads during winter. Explain why this is important. (1mk)
4. Explain the meaning of each of the following terms;
5. Efflorescence (1mk)
6. Hygroscopy (1mk)
7. Deliquescence (1mk)
8. Using dots ( ) and crosses (**X**), show bonding in magnesium nitride (Mg=12, N=7).(2mks)
9. Below is a table of 1st ionization energies for elements A, B, C, D which are metals

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ELEMENTS | A | B | C | D |
| IONIZATION ENERGY (KJ/MOLE) | 528 | 402 | 426 | 355 |

Arrange the elements in order of increasing reactivity. (2mks)

1. Dilute sulphuric (VI) acid was added to a compound of magnesium P.The solid reacted with the acid to form a colourless solution Q and colourless gas R which formed a white precipitate when bubbled through lime water.
2. Name;
3. Compound P (1mk)
4. Solution Q (1mk)
5. Colorless gas R (1mk)
6. Write a chemical equation for the reaction that took place. (1mk)
7. The diagram below represents a set up that can be used to prepare and collect oxygen gas.



1. Name solid A and state its role.

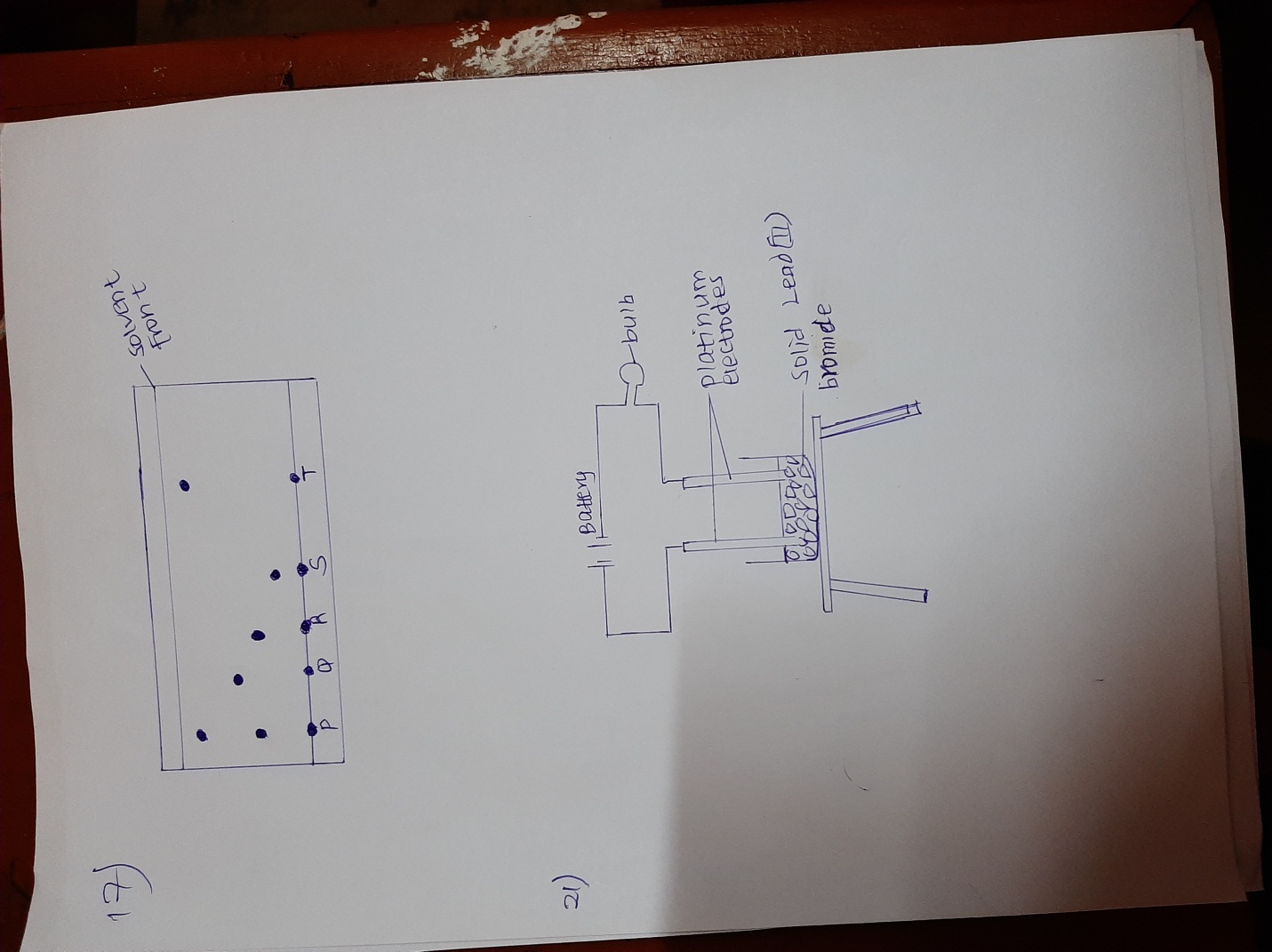
Solid A (1mk)

Role (1mk)

1. What property of oxygen makes it possible for its collection as indicated by the diagram?

(1mk)

1. Explain why it is important not to collect any gas for the first few seconds of the experiment. (1mk)
2. State two uses of oxygen gas. (2mks)
3. The chromatogram below was obtained from a contaminated food sample P. contaminants Q,R,S and T are suspected to be in P. Use it to answer the following questions.



1. Identify the contaminants in mixture P. (1mk)
2. Which is the least soluble contaminant in P? (1mk)
3. Two salts P and Q are weighed before and after heating. The results are given in the table below.

|  |  |  |
| --- | --- | --- |
| CARBONATE | MASS IN GRAMS | |
|  | BEFORE HEATING | AFTER HEATING |
| P | 5.0 | 5.0 |
| Q | 5.0 | 4.5g |
|  |  |  |

1. Which one is likely to be sodium carbonate? Explain . (2mks)
2. If the other salt is zinc carbonate, state the observation made in the process of heating.

(1mk)

1. A form two student was stung by a nettle plant and their chemistry teacher applied ammonia solution to the affected area of the skin and the student was relieved of pain. Explain. (2mks)
2. The table below gives some properties of substances I, II, III and IV. Study it and answer the questions that follow;

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SUBSTANCE | ELECTRICAL CONDUCTIVITY | | M.P (0C) | B.P (0C) |
|  | SOLID | MOLTEN |  |  |
| I | Does not conduct | Conducts | 801 | 1420 |
| II | Conducts | Conducts | 650 | 1107 |
| III | Does not conduct | Does not conduct | 1700 | 2200 |
| IV | Does not conduct | Does not conduct | 113 | 440 |

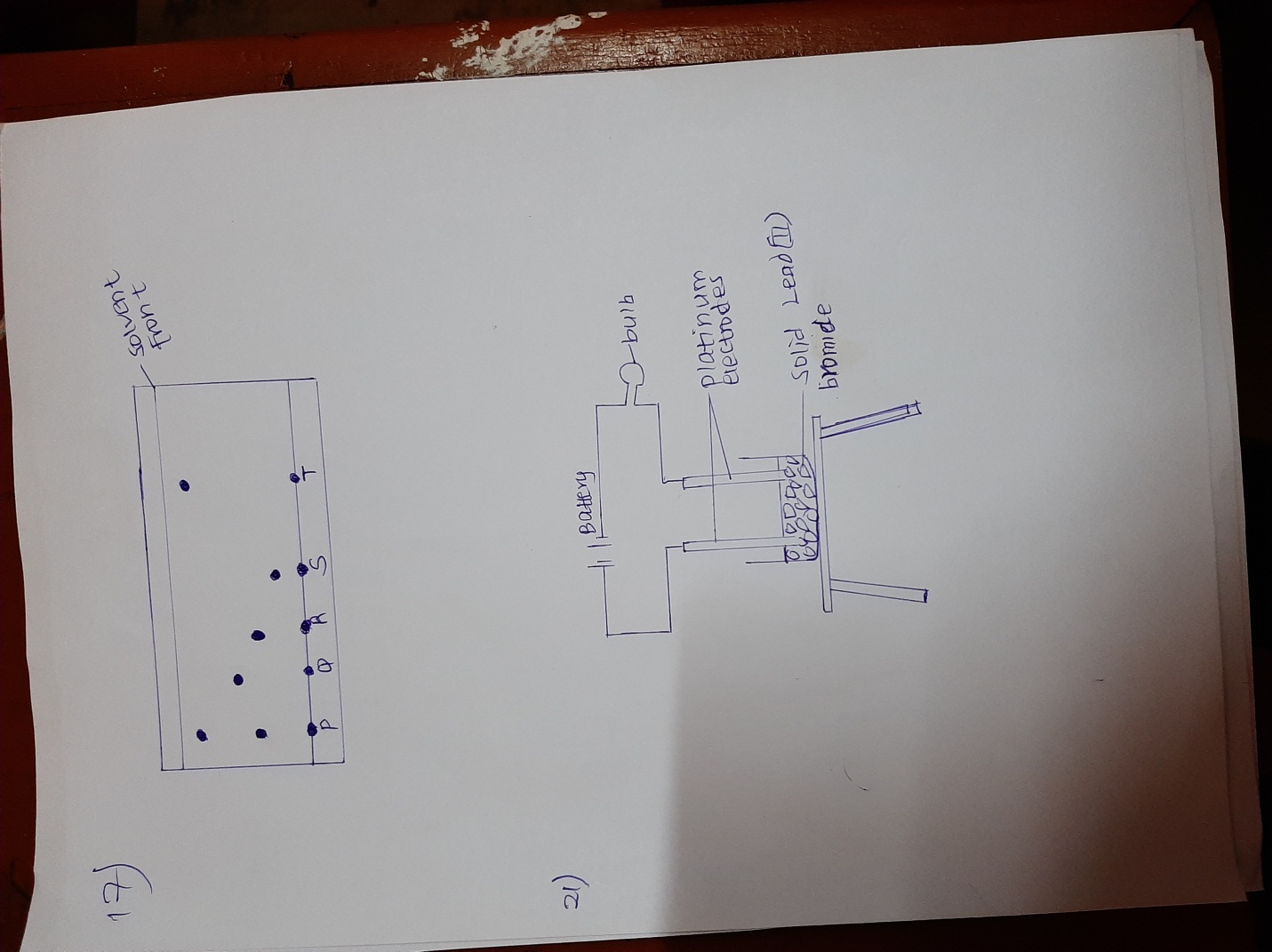
1. What type of bonding exists in substances

I (1mk)

II (1mk)

III (1mk)

1. Which substance is likely to be sulphur? Explain . (2mks)
2. In an experiment to investigate the conductivity of substances, a student used the setup shown below.



The student noted that the bulb did not light.

1. What had been omitted in the set-up? (1mk)
2. Explain why the bulb lights when the omission is corrected. (2mks)
3. In terms of structure and bonding, explain why graphite is used as a lubricant. (2mks)
4. State two uses of carbon (IV) oxide. (2mks)
5. Air was passed through several chambers as shown in the flow chart below.

OXYGEN

NITROGEN

NITROGEN

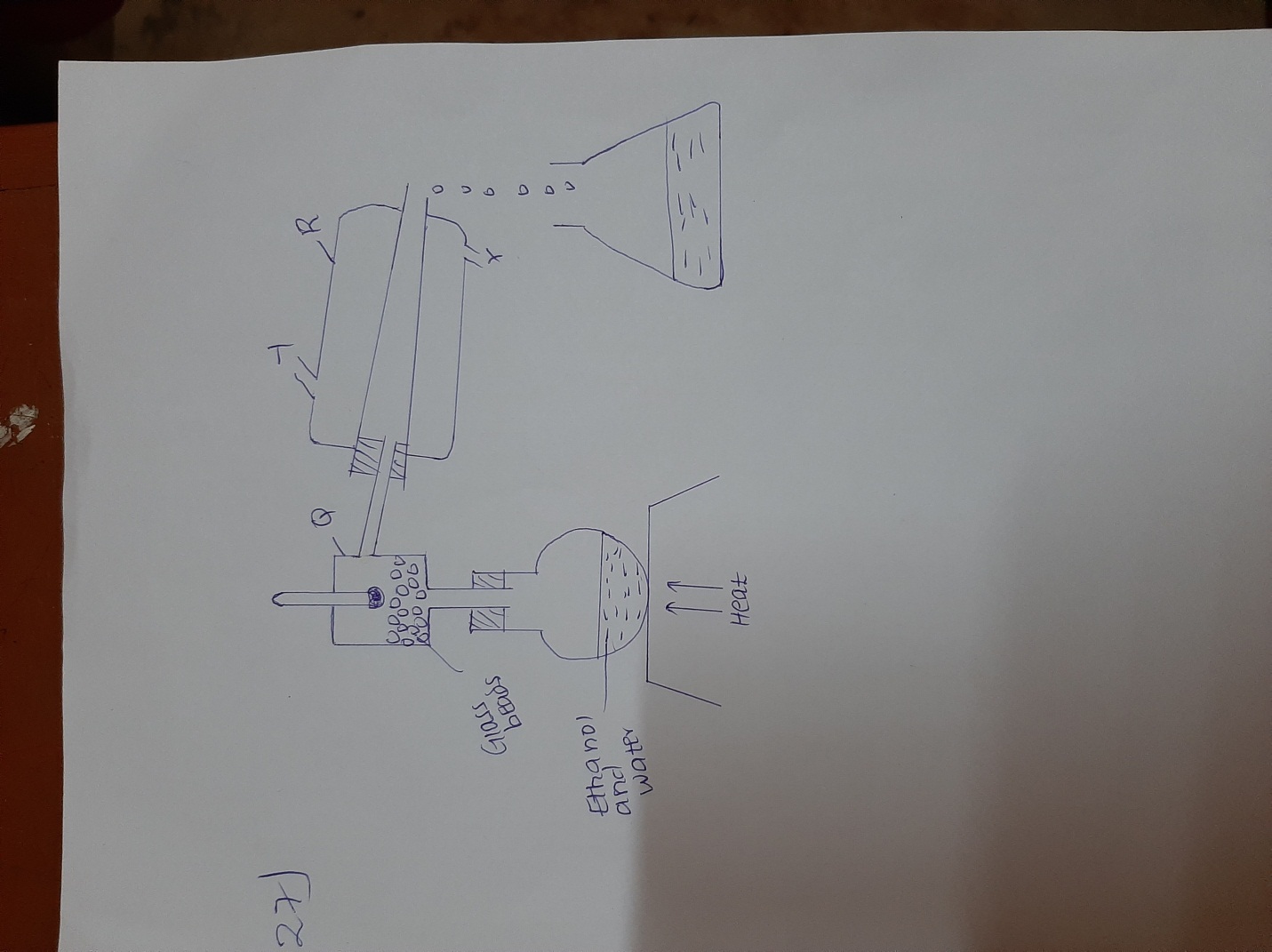
CARBON (IV) OXIDE STEP STEPS STEP

AIR OXYGEN

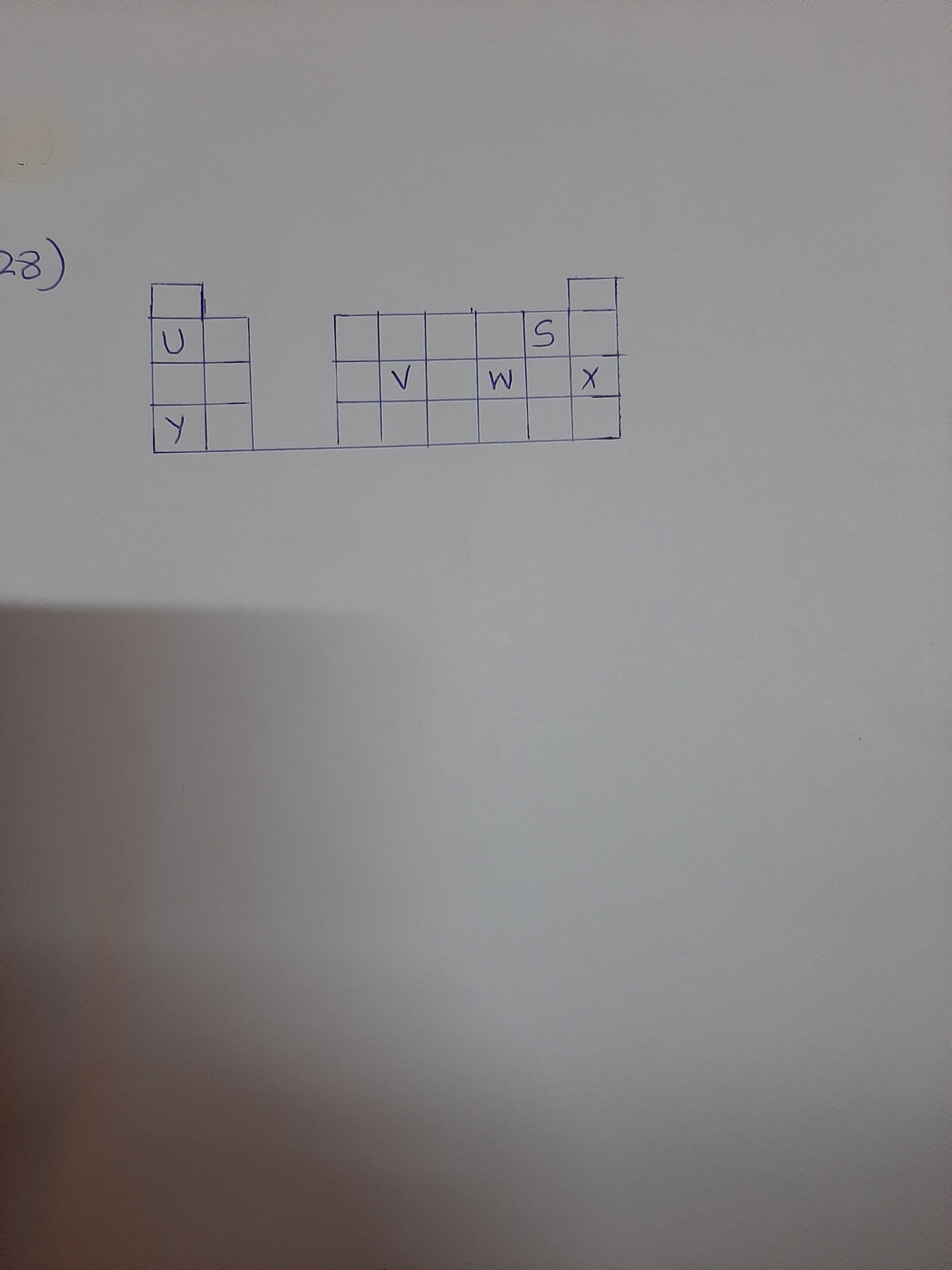
NITROGEN I II

1. Name the gases removed in;
2. Step I (1mk)
3. Step II (1mk)
4. State the reagent that can be used in :
5. Step I (1mk)
6. Step II (1mk)
7. Name two conditions for rusting. (1mk)
8. State three methods that are used to prevent rusting. (3mks)
9. State two uses of Sodium carbonate. (2mks)
10. The diagram below shows a set-up of apparatus used to separate a mixture of ethanol

(B.P =780C) and water (B.P =1000C).



1. Name the part labeled Q and state its function. (2mks)
2. Name the apparatus R. (1mk)
3. In the diagram, label water in and water out. (2mks)
4. Name the distillate that was collected first. Explain. (2mks)
5. Why is a round bottomed flask preferred for the experiment instead of the flat bottomed flask?. (1mk)
6. What is the purpose of glass beads?. (1
7. The grid below is a section of the periodic table. The letters do not represent the actual symbols of the elements. Use it to answer the questions that follow.



1. Select the elements which belong to the same;
2. Group (1mk)
3. Period (1mk)
4. What name is given to the family of elements to which X belongs? (1mk)
5. Write the chemical formula of the carbonate of element Y. (1mk)
6. Which letter represents the most reactive?
7. Metal (1mk)
8. Non-metal (1mk)
9. Name the bond formed when U and W react. Explain your answer. (2mks)
10. Indicate on the grid the position of an element represented by letter R whose atomic number is 15. (1mk)
11. Identify one element which does not form an oxide. (1mk)
12. Write three uses of alkali metals. (3mks)