**ANESTAR SCHOOLS**

**NAME………………………………………………………ADM………………….CLASS………………….**

**CHEMISTRY**

**FORM 3**

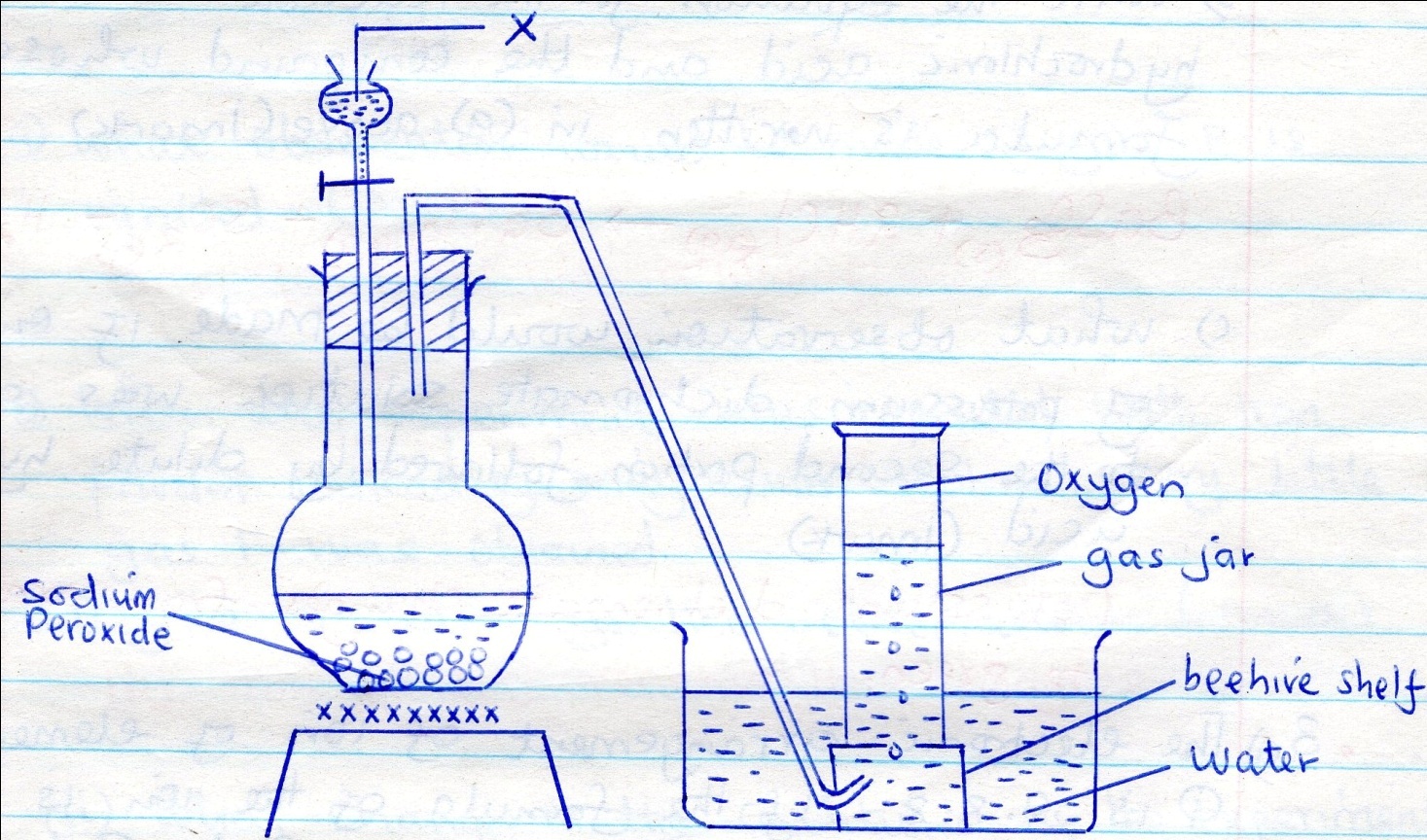
**MID – TERM EXAM – 2022**

***TIME: 2Hours***

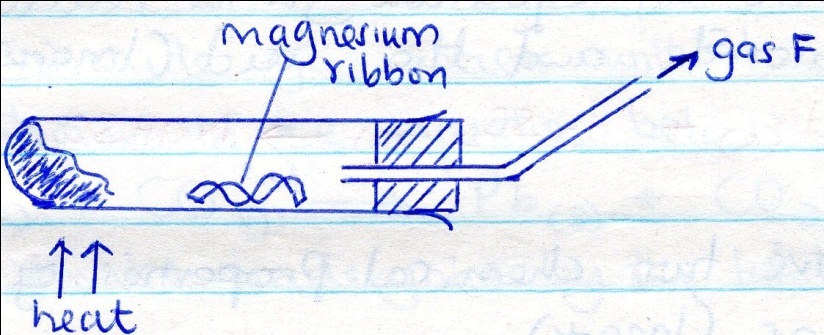
|  |  |
| --- | --- |
| **Question** | **Mask** |
| 1. **30** | **80** |

**Answer all question s in the space provided**

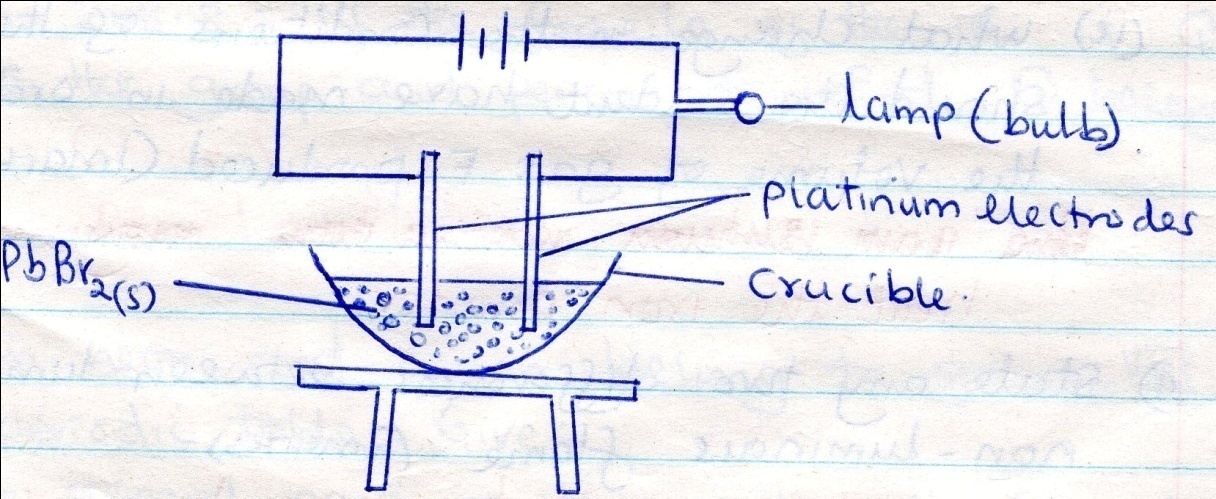
1. The set up below can be used to prepare oxygen gas. Study it and answer the questions that follows:



1. Identify X (1mks)
2. What property of oxygen makes it possible to be collected as shown in the above set up? (1mk)
3. State two uses of oxygen (1mks)
4. Potassium sulphate solution was prepared and divided into two portions. The first portion gave a white precipitate when reacted with barium nitrate. On addition of dilute hydrochloric acid, the white precipitate disappeared.
5. Write the formula of the compound formed as the white precipitate. (1mks)
6. Write the equation for the reaction between dilute hydrochloric acid and the compound whose formula is written in (a) above. (1mk)
7. What observation would be made if one drop of potassium dichromate solution was added to the second portion followed by dilute hydrochloric acid? (1mks)
8. .
9. The electronic arrangement of ion of element Q is 2.8.8. If the formula of the ion is Q3- state the group and period to which Q belongs. (1mk)
10. Helium, neon and argon belong to group VIII of the periodic table. Give;
11. The general name of these elements. (1mk)
12. One use of these elements. (1mk)
13. A student used the set up shown in the diagram below in order to study the reactions of some metals with steam. The experiment was carried out for ten minutes.



1. What observation would be made if gas F is ignited? (1mk)
2. When the experiment was repeated with iron powder instead of magnesium ribbon, very little gas F was obtained.
3. Give a reason for this observation. (1mk)
4. What change in the conditions of the experiment should the student have made in order to increase the volume of gas F produced? (1mk)
5. .
6. State any two differences between luminous and non – luminous flame. (2mks)
7. Explain how the hotness of a Bunsen flame can be increased. (1mk)
8. Hydrogen chloride gas can be prepared by reacting sodium chloride and an acid.
9. Write an equation for the reaction between sodium chloride and the acid. (1mk)
10. Give two chemical properties of hydrogen chloride gas. (1mk)
11. State two uses of hydrogen chloride gas. (1mks)
12. In an experiment to investigate the conductivity of substances, a student used the set up 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 light when the omission is collected. (2mks)
3. Dry carbon (II) oxide gas reacts with heated lead (II) oxide as shown in the equation below.

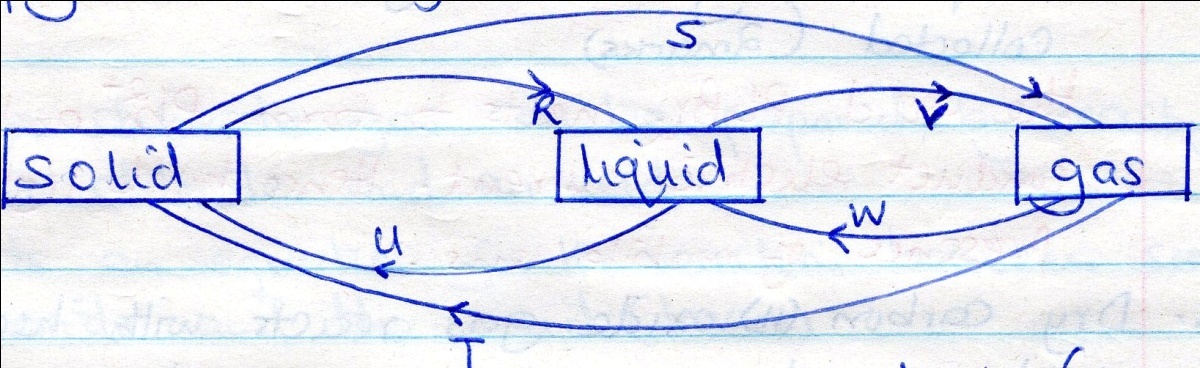
PbO(s) + CO(g) Pb (s) + CO2 (g)

1. Name the process undergone by the lead (II) oxide. (1mk)
2. Give a reason for your answer in (a) above. (1mk)
3. Name another gas that can be used to perform the same function as carbon (II) oxide. (1mk)
4. The table below gives atomic numbers of elements represented by letter A, B,C, and D.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | A | B | C | D |
| Atomic number | 15 | 16 | 17 | 20 |

Use the information to answer the questions that follow.

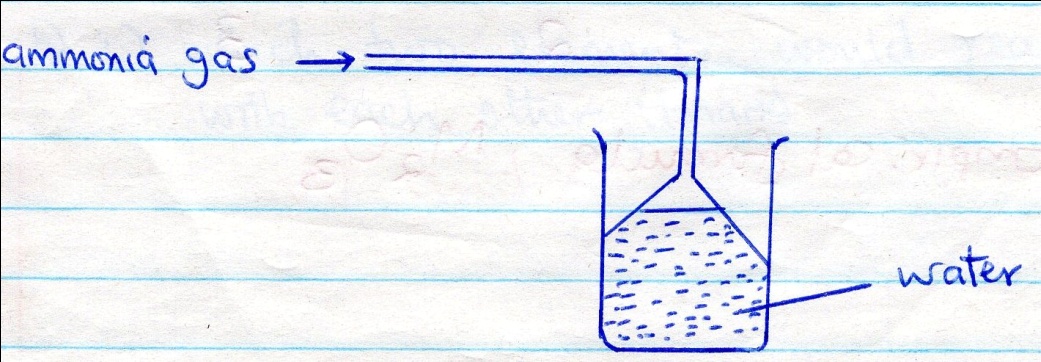
1. Name the type of bonding that exist in the compound formed when A and D react. (1mk)
2. Select the letter that represents the best oxidizing agent. Give a reason for your answer. (2mks)
3. The diagram below represents a relationship between the physical states of matter.



1. Identify the process R,V,W and U. (2mks)
2. Name one substance which can undergo process represented by letter S and T. (1mk)
3. Starting with copper metal, describe how a sample of crystals of copper (II) chloride may be prepared in the laboratory. (3mks)
4. .
5. State Boyles’ law. (1mk)
6. A gas occupies 500cm3 at 200c and 100000pa. what will be its volume at 100c and 101325pa. (3mks)
7. Bromine reacts with ethane as shown below

C2 H6 + Br2 C2 H5 Br + HBr

1. What condition is necessary for this reaction to occur? (1mk)
2. Write the structural formula of compound C2H5Br in the equation above. (1mk)
3. State one major use of hydrogenation process. (1mk)
4. Given the following substance; - wood ash, lemon juice, and sodium chloride
5. Name one commercial indicator that can be used to show whether wood ash, lemon juice and sodium chloride are acidic, basic or neutral. (1mk)
6. Classify the substance in (a) above as acids, bases or neutral (2mks)
7. .
8. Ammonia gas was passed into water as shown below.



1. Explain why the PH of the solution is above 7. (1mk)
2. What is the use of the inverted funnel? (1mk)
3. Explain why a high temperature is required for nitrogen to react with oxygen. (1mk)
4. The data given below was recorded when metal M was completely burnt in air. M is not the actual symbol of the metal. (R.A.M; M =56, O =16)

Mass of empty crucible and lid = 10.24g

Mass of crucible, lid and metal M = 10.352g

Mass of crucible, lid and metal oxide = 10.4g

1. Determine the mass of metal M. (1mk)
2. Determine the mass of oxygen. (1mk)
3. Determine the empirical of the metal oxide. (2mks)
4. The structure of methanoic acid is as follows

O

H – C

O - H

1. How many bonds have taken part in bonding to form this structure. (1mk)
2. How many electrons have taken part in bonding? (1mk)
3. When magnesium metal is burnt in air, it reacts with both oxygen and nitrogen gases giving a white ash. Write two equations for the reactions that take place. (2mks)
4. The table below gives the atomic numbers of element W, X, Y and Z. the letters are not the actual symbols of the elements.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | W | X | Y | Z |
| Atomic number | 9 | 10 | 11 | 12 |

1. Which one of the elements is least reactive? Explain. (1mk)
2. .
3. Which two elements would react most vigorously with each other? (1mks)
4. Give the formula of the compound formed when the elements in b(i) react. (1mk)
5. .
6. What is meant by Isomerism? (1mk)
7. Give the systemic names of the following organic compounds.
8. CH3 – C(CH3) (Br) – CH (Br) CH3 (1mk)
9. CH3 – CH - CH CH2 CH3 (1mk)

CH3 CH3

1. ,
2. Give a reason why concentrated sulphuric (vi) acid is not used to dry ammonia gas. (1mk)
3. Name one suitable drying agent for ammonia gas. (1mk)
4. In a laboratory experiment hydrogen gas was passed over heated copper (II) oxide as shown in the diagram below.



Describe a chemical test that can be used to identify the product E. (2mks)

1. State and explain what would happen if a dry red litmus paper was dropped in a gas jar of dry chlorine. (2mks)
2. .
3. State Graham’s law of diffusion. (1mk)
4. The molar masses of gases W and X are 16.0 and 44.0 respectively. If the rate of diffusion of W through a porous material is 12cm3/sec. calculate the rate of diffusion of X through the same material. (2mks)
5. The isotopes of oxygen are 1618O and 188O.
6. What are Isotopes? (1mk)
7. Determine the number of neutrons in 188O. (1mk)
8. When potassium nitrate is heated, it produces potassium nitrite and gas C.
9. Identify gas C (1mk)
10. Name the type of reaction undergone by potassium nitrate. (1mk)
11. Carbon and sulphur exhibit allotropy.
12. Name the two allotropes of sulphur. (1mk)
13. Which allotrope of carbon is the only non – metal electrical conductor? (1mk)
14. When solid A was heated strongly, it gave water and a solid residue. When water was added to the solid residue, the original solid A was formed.
15. What name is given to the process described? (1mk)
16. Give one example of solid A. (1mk)
17. Oleum (H2S2O7) is an intermediate product in the Industrial manufacture of sulphuric (vi) acid.
18. How is Oleum converted into sulphuric (vi) acid. (1mk)
19. Give one use of sulphuric (vi) acid. (1mk)
20. The table below shows the first ionization energy of elements B and C.

|  |  |
| --- | --- |
| Element | Ionisation energy KJmol-1 |
| B | 494 |
| C | 736 |

What do these values suggest about the reactivity of B compared to that of C? (2mks)