545/1
CHEMISTRY
Paper 1
(Theory)
18th July 2022
1 ½ Hours

Name : ……..……

Signature : …… Personal No : ……..

KAMPALA WAKISO GIANT SCHOOLS' ASSOCIATION (KWGSA)

National Joint Mock Examination 2022

Uganda Certificate of Education

CHEMISTRY

Paper 1

1 Hours 30 Minutes

INSTRUCTIONS TO CANDIDATES

- *The Paper consists of 50 objectives type questions*
- *Write the correct alternative* **A, B, C** *or* **C** *in the box provided on the right hand side of each question*
- *Silent non programmable calculators may be used.*

For Examiner's use only	
Question	**Marks**
MCQ	

1. Which of the following substances will give an acidic solution when dissolved in water?

A. $(NH_4)_2SO_4$.
B. CO_2.
C. Na_2O_2.
D. N_2O.

2. The gas formed when hypochlorous acid is exposed to sunlight is;

A. Chlorine.
B. Hydrogen.
C. Hydrogen Chloride.
D. Oxygen.

3. Washing soda is;

A. Anhydrous sodium carbonate
B. Hydrated Sodium Carbonate
C. Anhydrous calcium hydroxide.
D. Hydrated sodium chloride.

4. The atomic number of Calcium is 20. The electronic configuration of its ion Ca^{2+} is;

A. 2:8.
B. 2:8:8:2.
C. 2:8:8.
D. 2:8:2.

5. Magnesium ribbon reacts with hydrochloric acid according to the equation

$Mg(s) + 2HCl(aq) \rightarrow MgCl_2(aq) + H_2(g)$

The mass of magnesium ribbon required to liberate 4.48dm^3 of hydrogen at s.t.p is; (*1 mole of a gas occupies 22.4dm^3 at s.t.p, Mg = 24*)

A. $\left(\frac{4.48 \times 24}{22.4}\right)g$.
B. $\left(\frac{4.48 \times 22.4}{24}\right)g$.
C. $\left(\frac{24}{4.48 \times 22.4}\right)g$.
D. $\left(\frac{22.4}{4.48 \times 24}\right)g$.

6. Diamond is used in making jewellery because;

A. It is soft.
B. It does not conduct electricity.
C. It is naturally hard.
D. of its sparkling appearance..

7. Which **one** of the following compounds is unsaturated?

A. C_2H_6
B. C_3H_8
C. C_4H_8
D. C_4H_{10}

8. Which one of the following is the major impurity in haematite during the extraction of iron?

A. Coke.
B. Sulphur dioxide.
C. Phosphorus.
D. Silicon dioxide.

9. When dilute Nitric acid followed by Silver Nitrate solution were added to a certain solution, white precipitate was formed. The solution probably contained;

A. Sulphate ions
B. Nitrate ions
C. Sulphite ions
D. Chloride ions

10. Which **one** of the following gases is not dried using Sulphuric acid?

A. Carbon dioxide.
B. Oxygen.
C. Hydrogen Chloride.
D. Ammonia.

11. Which **one** of the following ions forms a deep blue solution with excess ammonia solution?

A. Fe^{3+}.
B. Zn^{2+}.
C. Cu^{2+}.
D. C*l*.

12. A gas which when bubbled through Sodium hydroxide for a long time produces a white precipitate is

A. Ammonia.
B. Sulphur dioxide.
C. Hydrogen Chloride.
D. Carbon dioxide.

13. 12.5cm of hydrochloric acid required 25cm^3 of 0.1**M** sodium hydroxide solution. The morality of the hydrochloric acid is;

A. $\frac{25\times 0.1}{12.5}$
B. $\frac{12.5\times 0.1}{25}$
C. $\frac{25}{12.5\times 0.1}$
D. $\frac{25\times 0.1}{1000}$

14. The atomic number of elements **W** and **Y** are **2:8:1** and **2:8:7** respectively. The type of bond formed between **W** and **Y** is;

A. Covalent.
B. Electrovalent.
C. Dative.
C. Metallic.

15. Potassium Carbonate reacts with hydrochloric acid according to the following equation

$K_2CO_3(aq)+2HCl(aq)\rightarrow 2KCl(aq)+CO_2(g)+H_2O(l)$

The volume of 0.3 hydrochloric acid required to react completely with 25cm^3 of 0.2**M** potassium carbonate solution is;

A. 20cm^2.
B. 40cm^2.
C. 50cm^2.
D. 30cm^2.

16. Which **one** of the following catalyst is used during the preparation of oxygen gas?

A. Manganese (IV) Oxide.
B. Reduced iron.
C. Platinised asbestas.
D. Vanadium (V) Oxide.

17. Duralunin is an alloy that consist mainly of;

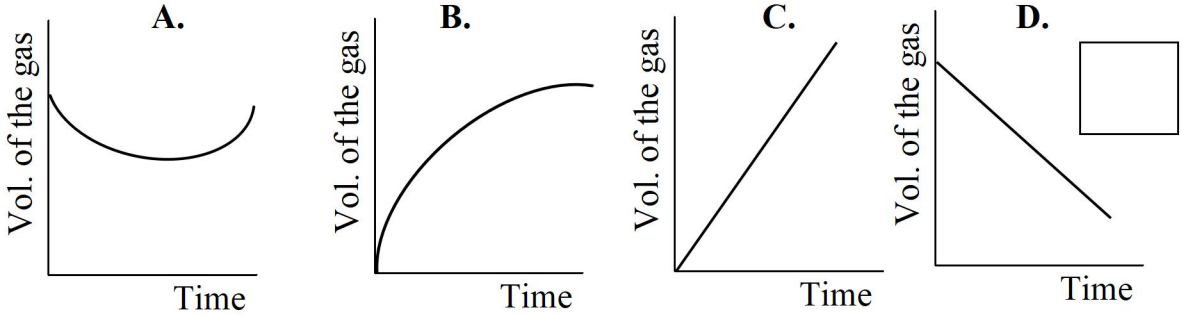
A. Cu, Mn, Mg and A*l*.
B. Cu and A*l*.
C. Cu, Mg A*l*.
D. Cu, A*l* and Si.

18. Chromatography is used to separate a mixture of;
A. Iron and Sodium Chloride.
B. Potassium Chloride and Sodium Carbonate.
C. Pigments of green leaf.
D. Ammonium Chloride and sand.

19. Which **one** of the following salts can be prepared by direct synthesis?
A. $CuSO_4$.
B. $ZnCl_2$.
C. $CaCO_3$.
D. $FeCl_3$.

20. When 1.2g of Zinc was reacted with 100cm^3 of 2**M** hydrochloric acid 13.6Kj of heat was evolved. The molar heat of reaction of Zinc metal with the acid is; (Zn = 64)
A. $\frac{64\times13.6}{1.2}$.
B. $\frac{1.2\times13.6}{64}$.
C. 13.6 x 1.2.
D. 1.2 x 64.

21. Magnesium reacts with Sulphuric acid producing hydrogen according to the equation
$Mg(s)+H_2SO_4(aq)\rightarrow MgSO_4(aq)+H_2(g)$
Which of the following graphs represents how the volume of the gas varies with time during the reaction?



22. A dilute solution of copper (II) sulphate was de electrolysed using copper electrode. The product at the Cathode is;
A. Oxygen gas.
B. Copper.
C. Sulphur.
D. Hydrogen gas.

23. Methane burns according to the following equation.

$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(g) \quad \Delta H = 890Kj$

The volume of methane gas which when burnt will raise the temperature of 32.0g of (1 mole of a gas occupies 22.4dm^3 at s.t.p, Specific heat capacity of water is 4.2Jg^{-1} ^{0}C^{-1})

A. $\left(\frac{10.8 \times 22.4}{890}\right)$.

B. $\left(\frac{22.4 \times 890}{10.8}\right)$.

C. $\left(\frac{890}{22.4 \times 10.8}\right)$.

D. $(10.8 \times 22.4 \times 890)$.

24. Which **one** of the following sets of substances is formed when Nitric acid is heated?

A. Nitrogen, Oxygen and Water.
B. Nitrogen monoxide, Oxygen and water.
C. Nitrogen dioxide, Oxygen and water.
D. Dinitrogen oxide, Oxygen and Water.

25. Zinc carbonate was strongly heated in a tube, the colour of the residue was…

A. Yellow when hot, brown when cold.
B. Brown when hot, yellow when cold.
C. Yellow when hot, white when cold.
D. Brown when hot, white when cold.

26. Which **one** of the following carbonates undergoes physical change when heated?

A. Zinc Carbonate.
B. Calcium Carbonate.
C. Potassium Carbonate.
D. Ammonium Carbonate.

27. Sulphuric acid is not suitable for the production of carbon dioxide when Calcium Carbonate is used because;

A. it is dibasic.
B. it is a strong Oxidizing agent.
C. of unsteady production of the gas.
D. it forms a coating that prevents further reaction.

28. Which **one** of the following is <u>NOT</u> a property of Graphite? It;

A. is very hard.
B. conducts electricity.
C. is black.

D. burns in air forming Carbon dioxide.

29. Cobalt Chloride paper is used to test for presence of water. When water is present, the paper changes from….

A. pink to blue.
B. blue to pink.
C. yellow to orange.
D. Orange to yellow.

30. Which **one** of the following processes will **not** produce Oxygen gas?

A. Combustion of fuels.
B. Photosynthesis.
C. Electrolysis of water.
D. Heating Sodium Nitrate

31. Which **one** of the following solutions contains the same number of moles of sodium ions as in $100cm^3$ of 0.05M, Na_2SO_4 solution?

A. 0.015M Na_2CO_3.
B. 0.01M NaC*l*.
C. 0.03M $NaNO_3$.
D. 0.05M $NaHCO_3$.

32. Which **one** of the following formulae represents an alkane?

A. C_3H_6
B. C_3H_4
C. C_4H_{10}
D. C_4H_8

33. All the following are **not** neutral oxides **except**?

A. Fe_3O_4.
B. Fe_2O_3.
C. NO.
D. N_2O_4.

34. The element most likely to remove Oxygen from Zinc Oxide when a mixture of the Oxide and the element is heated is;

A. lead.
B. copper.
C. magnesium.
D. iron.

35. An element **Q** react rapidly with steam and slowly with cold water. **Q** is likely to be;

A. Calcium.
B. Magnesium.
C. Sodium.
D. Potassium.

36. The element that forms an oxide which react with sodium hydroxide solution is known as;

A. Calcium.
B. Sodium.
C. Aluminium.
D. Magnesium.

37. The air component that shows a reduction in the volume when air is passed over heated copper metal is;

A. Oxygen.
B. Water Vapor.
C. Nitrogen.
D. Carbon dioxide.

38. Which **one** of the following anions forms a white precipitate with barium nitrate soluble in Nitric acid?

A. SO_4^{2-}
B. CO_3^{2-}.
C. Cl^-.
D. NO_3^-.

39. Which **one** of the following hydroxides would undergo atmospheric oxidation in the presence of moisture?

A. $Fe(OH)_2$
B. $Fe(OH)_3$.
C. $Al(OH)_3$.
D. $Cu(OH)_2$.

40. The reaction between two substances is exothermic. Which **one** of the following is most likely to slow down the rate of reaction?

A. increasing the temperature of the surrounding.
B. placing the reagents in the ice bath.
C. having excess of one of the reactants.
D. removing the products as fast as they are formed.

In each of the questions 41 to 45 consists of an assertion (Statement) on the left hand side and a reason on the right hand side.

Select as follows;

A. If both the assertion and the reason are true statements and the reason is a correct explanation of the assertion.

B. If both the assertion and the reason are true statements but the reason is not a correct explanation of the assertion.

C. If the assertion is true but the reason is not a correct statement

D. If the assertion is not correct but the reason is a correct statement.

Instructions Summarized

Assertion		Reason
A	True	True (Reason is a correct explanation)
B	True	True (Reason is not a correct explanation)
C	True	Incorrect
D	Incorrect	Correct

41.	Hydrogen Chloride gas conducts electricity.	**because**	Hydrogen Chloride is soluble in water.	
42.	The monoxide of Carbon is neutral.	**because**	Carbon is a group (iv) element	
43.	Polythene is a thermal softening plastic	**because**	Polythene can be remoulded on cooling.	
44.	Dry ammonia gas turns a moist red litmus paper to blue.	**because**	Ammonia gas is an alkaline gas.	
45.	Ammonia gas can be dried using concentrated Sulphuric acid	**because**	Concentrated Sulphuric acid is a dehydrating agent.	

In each of the questions 46 to 50, one or more of the answers given may be correct. Read each question carefully and then indicate the correct answer according to the following.

A. If, 1, 2 and 3 only are correct
B. If 1 and 3 only are correct
C. If 2 and 4 only are correct
D. If 4 only is correct

46. Which **one** of the following chemical compounds is/are used as fertilizers?

1. Ammonium Sulphate.
2. Sodium Carbonate.
3. Sodium Phosphate.
4. Calcium Hydrogen Carbonate.

47. Which of the following substances is/are used to correct brown sugar to white sugar?

1. Sulphur dioxide.
2. Bleaching powder.
3. Animal charcoal.
4. Calcium Hydrogen Carbonate.

48. Nitric acid shows the following properties.

1. Turns litmus paper blue.
2. forms salts with bases.
3. is a powerful reducing sugar.
4. produces carbon dioxide with carbonates.

49. Which **one** of the following process(es) requires hydrogen?

1. Haber process.
2. Contact process.
3. Hardening Oil.
4. Polymerization.

50. Which **one** of the following molecular formula is/are of alkane(s)?

1. C_2H_6.
2. C_2H_4.
3. C_3H_8.
4. C_6H_6.

END