Name..... Signature.....

School..... Index No.....

545/1
CHEMISTRY
Paper 1
1 ½ hours

WAKISSHA

Uganda Certificate of Education

CHEMISTRY

Paper 1

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

This paper consists of **50** *objective-type questions.*

Answer **all** *questions.*

You are required to write the correct answer **A**, **B**, **C** *or* **D** *in the box provided on the right hand side of each question.*

Use pen and write clearly.

Do not use pencil.

For examiner's use only

1. A mixture of iron (II) chloride and sulphur can be separated by
   A. chemical means.
   B. use of a magnet.
   C. by introducing carbon to the mixture.
   D. fractional crystallization.

2. The solid deposit formed when hydrogen sulphide reacts with sulphuric acid is
   A. Hydrogen sulphide.
   B. Sulphur dioxide.
   C. Sulphur.
   D. Sulphur trioxide.

3. The Oxide of nitrogen that relights a glowing splint is
   A. Dinitrogen oxide.
   B. Nitrogen monoxide.
   C. Nitrogen dioxide.
   D. Dinitrogen tetra oxide.

4. The best way to test for the purity of water in the laboratory is by.
   A. using anhydrous copper (II) sulphate.
   B. using cobalt (II) chloride paper.
   C. checking the boiling point.
   D. carrying out distillation.

5. Which one of the following substances will give an acidic solution when dissolved in water?
   A. $(NH_4)_2SO_4$
   B. CO_3
   C. $N_{a2}\,O_2$
   D. N_2O

6. The gas formed when hypochlorous acid is exposed to sunlight is
   A. chlorine.
   B. hydrogen.
   C. hydrogen chloride.
   D. Oxygen.

7. Washing soda is
   A. Anhydrous sodium carbonate.
   B. Hydrated sodium carbonate.
   C. Anhydrous calcium hydroxide.
   D. hydrated sodium chloride.

8. Nitrogen monoxide reacts with oxygen according to the equation
   $2\,NO_{(g)} + O_{2\,(g)} \longrightarrow 2\,NO_{2(g)}$
   What volume of oxygen that would react with $200cm^3$ of nitrogen monoxide?
   A. $100cm^3$
   B. $200cm^3$
   C. $300cm^3$
   D. $400cm^3$

9. The atomic number of calcium is 20. The electronic configuration of it ion Ca^{2+} is
   A. 2, 8
   B. 2, 8, 8, 2
   C. 2, 8, 8
   D. 2, 8, 2

10. Magnesium ribbon reacts with hydrochloric acid according to the equation.
$Mg_{(s)} + 2HCl_{(aq)} \longrightarrow M_g Cl_{2(aq)} + H_{2(g)}$
The mass of magnesium ribbon required to liberate $4.48dm^3$ of hydrogen at s.t.p is
(Mg = 24, 1 mole of a gas occupies $22.4dm^3$ at s.t.p)

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. $\left(\frac{22.4}{4.48 \times 24}\right) g$

11. In the Daniell cell, Zinc half cell is connected by a salt bridge to the copper half-cell. The substance that acts as the anode in the cell is. ☐
A. Copper
B. Zinc
C. Copper (ii)sulphate
D. Zinc sulphate

12. Diamond is used in making jewelry because ☐
A. its soft.
B. it does not conduct electricity.
C. it is naturally hard.
D. of its sparkling appearance.

13. Which one of the following compounds is un saturated. ☐
A. $C_2 H_6$
B. $C_3 H_8$
C. $C_4 H_8$
D. $C_4 H_{10}$

14. Which one of the following is the major impurity in Haematite during the extraction of iron. ☐
A. Coke.
B. Sulphur dioxide.
C. Phosphorous.
D. Silicon dioxide.

15. 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 irons.
B. nitrate ions
C. sulphite ions
D. Chloride ions

16. Which one of the following gases is NOT dried using sulphuric acid? ☐
A. Carbon dioxide
B. Oxygen
C. Hydrogen chloride
D. Ammonia

17. Which one of the following ions forms a deep blue solution with excess ammonia solution.
A. F_e^{3+}
B. Z_n^{2+}
C. C_u^{2+}
D. Cl

18. A gas which when bubbled through sodium hydioxide for a long time produces a white precipitation is
A. Ammonia
B. sulphur dioxide
C. hydrogen chloride
D. Carbon dioxide

19. $12.5cm^3$ of hydrochloric acid required $25cm^3$ of 0.1m sodium hydroxide solution. The molarity 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. $\frac{25 \times 0.1}{1000}$

20. 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
D. Metallic

21. Potassium carbonate reacts with hydrochloric acid according to the following equation.
$K_2CO_{3(aq)} + 2HCl_{(aq)} \longrightarrow 2KCl_{(aq)} + CO_{2(g)} + H_2O_{(l)}$
The volume of 0.2M hydrochloric acid required to react completely with $25cm^3$ of 0.2M potassium carbonate solution is.
A. $20cm^2$
B. $40cm^3$
C. $50cm^3$
D. $30cm^3$

22. Which one of the following catalyst is used during the preparation of oxygen gas?
A. Manganese (IV) oxide
B. Reduced iron
C. Platinised asbestos
D. Vanaduim (v) oxide

23. Duralumin is an alloy that consist mainly of
A. C_u, M_n, M_g and A L
B. C_u and AL
C. C_u M_g AL
D. C_u, AL and Si

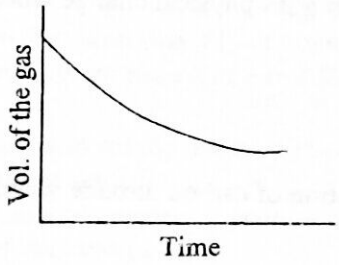
24. Chromatography is used to separate a mixture of
A. Iron and sodium chloride.
B. Potassium chloride and sodium carbonate.
C. Pigments of green leaf.
D. Ammonium chloride and sand.

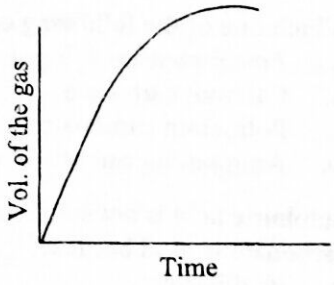
25. Ammonia reacts with copper (II) oxide to form copper according to the following equation $2NH_{3(g)} + 3CuO_{(s)} \longrightarrow 3H_2O_{(l)} + N_{2(g)} + 3Cu_{(s)}$
The mass of copper (II) oxide required to react with $200cm^3$ of ammonia at s.t.p is (H = 1, Cu = 64, O = 16, N = 14, one mole of gas occupies $22400cm^3$ at s.t.p
A. 1.07g
B. 4.28g
C. 2.14g
D. 8.57g

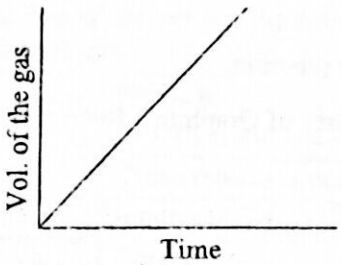
26. Which one of the following salts can be prepared by direct synthesis.
A. $CuSO_4$
B. $ZnCl_2$
C. $CaCO_3$
D. Fe Cl_3

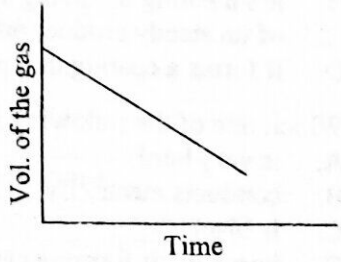
27. When 1.2g of Zinc was reacted with $100cm^3$ of 2M hydrochloric acid. 13.6KJ of heat was evolved. The molar heat of reaction of zinc metal with the acid is [Zn = 64]
A. $\frac{64 \times 13.6}{1.2}$
B. $\frac{1.2 \times 13.6}{64}$
C. 13.6 x 1.2
D. 1.2 x 64

28. Magnesium reacts with sulphuric acid producing hydrogen according to the equation.
$Mg_{(s)} + H_2SO_4^{(aq)} \longrightarrow MgSO_4^{(aq)} H_2(g)$
Which of the following graphs represents how the volume of the gas varies with time during the reaction?

A.


B.


C.


D.


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

30. Methane burns according to the following equation
$CH_{4(g)} + 2O_{2(g)} \longrightarrow CO_{2(g)} + 2H_2O_{(g)}$ $\Delta H = -890KJ$
The volume of methane gas which when burnt will raise the temperature of 320g of water by 8^0C is
[1 mole of gas occupies $22.4dm^3$ at s. t. p, specific heat capacity of water is $4.2Jg^{-1}\,{}^0C^{-1}$]

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

31. 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.

32. 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.

33. Which one of the following carbonates under goes physical change when heated.
A. Zinc carbonate
B. Calcium carbonate
C. Potassium carbonate
D. Ammonium carbonate

34. Sulphuric acid is not suitable for the production of carbon dioxide when calcium carbonate is used because,
A. its dibasic.
B. it's a strong oxidizing agent.
C. of un steady production of the gas.
D. it forms a coating that prevents further reaction.

35. Which one of the following is NOT a property of Graphite? It;
A. is very hard.
B. conducts electricity.
C. is black.
D. burns in air forming carbon dioxide.

Cobalt chloride paper is used to test for the 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.

37. Which one of the following process will NOT produce oxygen gas?

A. Combustion of fuels
B. Photosythesis.
C. Electrolysis of water.
D. Heating sodium nitrate.

38. The percentage of water of crystallization in sodium carbonate ($Na_2 CO_3 . 10 H_2O$) is (Na = 23, C = 12, O = 16, H = 1)

A. $\left(\frac{286}{180 \times 100}\right)$

B. $\left(\frac{180}{286} \times 100\right)$

C. $\left(\frac{286 \times 100}{180}\right)$

D. $\left(\frac{180}{286 \times 100}\right)$

39. Which one of the following solutions contains the same number of moles of sodium ions as in $100cm^3$ of 0.05M. $Na_2 SO_4$ solution?

A. 0.015M $Na_2 CO_3$
B. 0,01M Na Cl
C. 0.03M $Na NO_3$
D. 0.05M $Na HCO_3$

40. 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

Each of the following questions 41 – 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 assertion and reason are **true** statements and the reason is the **correct** explanation of the assertion.
B. If both assertion and reason are **true** statements but the reason is **not** the **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 Summarised

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

Turn Over

41.	Hydrogen chloride gas conducts electricity	because	hydrogen chloride is soluble in water.	
42.	The mono oxide of carbon is neutral	because	carbon is a group (IV) element.	
43.	Zinc hydroxide is soluble in excess aqueous ammonia	because	Zinc hydroxide is amphoteric.	
44.	When aqueous potassium iodide was added to a solution of lead(II) ions, a yellow precipitate was formed	because	lead (II) iodide is soluble in water.	
45.	Ethane when bubbled through bromine water, the reddish brown colour turns colourless	because	Ethane is a saturated hydro carbon.	

In each of the question 46 – 50 one or more of the answers may be correct. Read each question carefully and then indicate the correct answer as: A, B, C or D 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.

Instructions Summarised.

A	B	C	D
1, 2, 3 only	1 and 3 only	2 and 4 only	4 only

46. Which of the following chemical compounds is / are used as fertilizer(s)
1. Ammonium sulphate
2. Sodium carbonate
3. Sodium phosphate
4. Calcium nitrate

47. Which of the following substance(s) is/are commonly 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 blue
2. Forms salts with bases
3. Is a powerful reducing agent
4. Produces carbon dioxide with carbonates

49. Which one of the following contains the same volume as 8.0g of sulphur dioxide at s.t.p.
1. 5.5g of carbon dioxide
2. 10.6g of sulphur dioxide
3. 5.75g of nitrogen dioxide
4. 23g of oxygen gas

50. When hydrogen reacts with heated copper (II) oxide
1. Copper (II) oxide is reduced
2. Hydrogen is reduced
3. Hydrogen is oxidized
4. Copper is oxidized