CANDIDATES NAME:……

INDEX NUMBER							

SIGNATURE: ……

545/1
CHEMISTRY
PAPER 1
JUNE/JULY
1 HOUR 30 MINUTES

MOCK EXAMINATIONS SET 1 2019

Uganda Certificate of Education

CHEMISTRY
PAPER 1

1 HOUR 30 MINUTES

INSTRUCTIONS TO CANDIDATE:

- *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.*
- *Do not use pencil.*

1. Which one of the following gases relights a glowing splint?

A. hydrogen B. nitrogen

C. dinitrogen oxide D. nitrogen monoxide

2. Which of the following pairs of salts can be separated by filtration?

A. Na_2CO_3 and $(NH_4)_2CO_3$ B. $Pb(NO_3)_2$ and $PbCl_2$

C. $MgSO_4$ and $MgCl_2$ D. $ZnCO_3$ and $CaSO_4$

3. Which one of the following substances can alter the rate of chemical reaction between zinc and dilute hydrochloric acid.

A. manganese (IV) oxide B. copper (II) sulphate

C. vanadium (V) oxide D. iron (III) chloride

4. Which one of the following oxides is soluble in both dilute nitric acid and concentrated sodium hydroxide solution?

A. Al_2O_3 B. CuO C. SO_2 D. Fe_2O_3

5. The atomic numbers of elements M, N, and T are 1, 8, 12 and 14 respectively. The element which can form ions by either losing or gaining electron(s) is:

A. R B. T C. N D. M

6. The molecular formula of $5.6dm^3$ of an oxide containing 11.0g is (N = 14, O = 16, C = 12, S = 32, 1 mole of gas occupies $22.4dm^3$)

A. SO_2 B. NO_2 C. CO_2 D. SO_3

7. The process by which physical properties of natural rubber are improved is:

A. polymerisation B. vulcanisation

C. saponification D. cracking

8. $20cm^3$ of a monobasic acid was neutralised by $25cm^3$ of a 0.05m sodium carbonate. The molarity of the acid is?

A. $\frac{25 \text{ x } 0.05 \text{ x } 2}{2.0}$ M B. $\frac{25 \text{ x } 0.05}{20}$ M

C. $\frac{25 \text{ x } 0.05}{2 \text{ x } 20}$ M D. $\frac{20 \text{ x } 0.05 \text{ x } 2}{25}$ M

9. Which one of the following carbonates when heated decomposes without leaving a solid residue?

A. magnesium carbonate B. copper (II) carbonate

C. lead (IV) carbonate D. ammonium carbonate

10. The order of reactivity of the elements X, Y and Z is Z>X>Y. Which one of the following equations represents possible reaction?

A. $Y_{(s)} + X^{2+}_{(aq)} \longrightarrow X_{(s)} + Y^{2+}_{(aq)}$

B. $Z_{(s)} + Y^{2+}_{(aq)} \longrightarrow Z^{2+}_{(aq)} + Y_{(s)}$

C. $Y_{(s)} + Z^{2+}_{(aq)} \longrightarrow Y^{2+}_{(aq)} + X_{(s)}$

D. $X_{(s)} + Z^{2+}_{(aq)} \longrightarrow Z_{(s)} + X^{2+}_{(aq)}$

11. Which one of the following sets of compounds belong to the same homologous series?

A. C_2H_4, C_3H_6 and C_4H_8

B. C_2H_6, C_2H_2 and C_3H_8

C. C_2H_2, C_3H_6 and C_4H_{10}

D. C_2H_6, C_4H_8 and C_3H_8

12. The structure of an atom of element M is ${}^{27}_{13}M$. Which one of the following is the number of electrons in the outer most energy level of the particle M^{3+}?

A. 13 B. 10 C. 8 D. 3

13. Which of the following compounds in water does not contain ions?

A. ethanol B. sodium chloride

C. sodium hydroxide D. ammonia

14. 5g of an organic compound C_2H_6O when burnt raised the temperature of 500g of water from 15^0C to 90^0C. The molar heat of combustion of the compound is: (C = 12, H = 1, O = 16, specific heat capacity of water is $4.18Jg^{-1}{}^0C^{-1}$)

A. $-1249.82Kjmol^{-1}$ B. $-135.85Kjmol^{-1}$

C. $-167.20Kjmol^{-1}$ D. $-1538.24Kjmol^{-1}$

15. The percentage of Aluminium in hydrated Aluminium sulphate $Al_2(SO_4)_3$ nH2O is 8.1%. The value of n in the hydrated compound is
(H = 1, O = 1, Al = 27, S = 32)

A. 10 B. 18 C. 16 D. 12

16. Which one of the following substances will dissolve in water to give a solution that turns red litmus blue.

A. NaCl B. CH_3COOH

C. K_2CO_3 D. $(NH_4)_2SO_4$

17. Which one of the following is an example of unsaturated hydrocarbon?

A. C_3H_8 B. C_2H_6 C. C_4H_{10} D. C_3H_6

18. concentrated sulphuric was added to a solid Z, and white fumes of gas were produced. The anion in solid Z is:

A. sulphate ion B. chloride ion
C. carbonate ion D. nitrate ion

19. Which one of the following ion is discharged at the cathode when brine is electrolyzed using mercury cathode?

A. sodium B. hydrogen C. hydroxide D. Chloride

20. Ammonia reacts with copper (II) oxide according to the following equation.

$2NH_{3(g)} + 3CuO_{(s)} \rightarrow 3H_2O_{(l)} + N_{2(g)} + 3Cu_{(s)}$

The volume of ammonia at s.t.p that will react with 6.0g of copper (II) oxide is (H = 1, N 14, O = 16, Cu = 64, one mole of gas occupies $22.4dm^3$ at s.t.p)

A. $3.36dm^3$ B. $2.52dm^3$ C. $1.68dm^3$ D. $1.12dm^3$

21. The suitable method of preparing anhydrous iron (II) chloride is by;

A. passing dry chlorine over heated iron.
B. reacting iron (II) oxide with dilute hydrochloric acid
C. passing dry hydrogen chloride gas over heated iron
D. reacting iron with dilute hydrochloric acid

22. Which one of the following metals will not react with dilute acid?

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

23. Which one of the following cations forms a white precipitate insoluble in excess ammonia but shows no observable change when dilute sulphuric acid is added to it?

A. Zn^{2+} B. Pb^{2+} C. Ca^{2+} D. Al^{3+}

24. The volume of 0.2M hydrochloric acid that will completely neutralise $23cm^3$ of 0.25M sodium hydroxide is:

A. $\frac{23 \times 0.25}{0.2}$ B. $\frac{23 \times 0.2}{25}$ C. $\frac{25 \times 0.2}{23}$ D. $\frac{25 \times 23}{0.2}$

25. The product formed when excess sulphur dioxide is bubbled through sodium hydroxide solution is:

A. sodium sulphite B. sodium sulphate
C. sodium hydrogen sulphite D. sodium hydrogen sulphate

26. Which one of the following metals can be extracted by reduction process?

A. sodium B. copper C. potassium D. calcium

27. The gas produced when dilute hydrochloric acid is added to iron(II) sulphide is:

A. chlorine B. hydrogen

C. hydrogen sulphide D. hydrogen chloride

28. Which one of the following substances is not formed when copper (II) nitrate is heated strongly?

A. O_2 B. CuO C. NO_2 D. NO

29. 0.19g of metal Y reacted with dilute hydrochloric acid forming ion Y^{2+} and evolving $180cm^3$ of hydrogen gas at s.t.p. The relative atomic mass of Y is: (Molar gas volume at s.t.p is $22.4dm^3$)

A. 23.5 B. 42.2 C. 11.8 D. 30.2

30. Element Y has atomic number 14. The chemical bond in the hydride of Y is;

A. ionic bond B. covalent bond

C. dative bond D. metallic bond

31. Which one of the following substances will conduct electricity in solid state?

A. copper (II) sulphate B. sulphur

C. copper D. silicon dioxide

32. In which of the following reactions is sulphuric acid behaving as an oxidising agent?

A. $H_2SO_4(aq) + CuCO_3(s) \rightarrow CuSO_4(aq) + H_2O(l) + CO_2(aq)$

B. $H_2SO_4(aq) + CuO(s) \rightarrow CuSO_4(aq) + H_2O(l)$

C. $2H_2SO_4(aq) + C(s) \rightarrow 2SO_2(g) + CO_2(g) + 2H_2O(l)$

D. $H_2SO_4(aq) + Mg(OH)_2(s) \rightarrow MgSO_4(aq) + H_2O(l)$

33. $40cm^3$ of carbon dioxide reacted with $40cm^3$ of oxygen to carbon dioxide according to the equation below.

$2CO_{(g)} + O_{2(g)} \longrightarrow 2CO_{2(g)}$

The volume of the gas that was left unreacted is:

A. $20cm^3$ B. $40cm^3$ C. $80cm^3$ D. $30cm^3$

34. Sea water contains dissolved salts. When chlorine was bubbled through sea water a reddish brown solution was formed. The most likely dissolved salt present is?

A. KI B. NaBr C. NaCl D. $MgCl_2$

35. Two gases X_2 and Y_2 react to form a gaseous compound XY3 according to the following equation.

$X_{2(g)} + 3Y_{2(g)} \leftrightarrows 2XY_{3(g)}$ DH = -44KJ.

The yield of XY_3 can be increased by:

A. increasing volume and lowering temperature
B. decreasing volume and lowering temperature
C. increasing temperature and decreasing volume
D. increasing temperature and increasing volume

36. Which one of the following substances is used in both preparation of oxygen and chlorine?

A. MnO_2 B. $KClO_3$ C. $KMnO_4$ D. $MnSO_4$

37. 0.5g of impure copper (II) oxide reacted with 50cm3 of 0.1m nitric acid according to equation below.

$CuO_{(s)} + 2HNO_{3(aq)} \longrightarrow Cu(NO_3)_{2(aq)} + H_2O_{(l)}$

The percentage of the copper (II) oxide in the impure sample is
(Cu = 64, O = 16, N = 14, H = 1)

A. $\frac{80 \times 50 \times 0.1}{0.5}\%$ B. $\frac{80 \times 50 \times 0.1}{20}\%$

C. $\frac{80 \times 50 \times 0.1}{10}\%$ D. $\frac{50 \times 0.1 \times 10}{80}\%$

38. The residual gas produced when dry air is passed through concentrated sodium hydroxide and then over heated copper is:

A. oxygen B. carbon dioxide
C. hydrogen D. nitrogen

39. Which one of the following will give a visible change when solution of sodium sulphate is added to it?

A. Mg^{2+} B. Ba^{2+} C. Zn^{2+} D. Al^{3+}

40. A compound P has molecular mass of 60 and contains 40% carbon, 6.71% hydrogen while the rest is oxygen. The molecular formula of P is?

A. CH_2O B. C_2H_4O C. $C_2H_4O_2$ D. CH_4O_2

Each of the questions 40 to 45 consists of an assertion (statement) on the left hand side. Select;

A. If both assertion and reason are true statements and the reason is a correct explanation for the assertion.
B. If both assertion and reason are true statements but the reason is not a correct explanation for the assertion.
C. If the assertion is true but the reason is not a correct statement.
D. If the assertion is incorrect but the reason is a true statement.

SUMMARY OF INSTRUCTIONS.

	ASSERTION	**REASON**
A	True	True (correct explanation)
B	True	True (Not correct explanation)
C	True	Not correct
D	Not correct	True statement

40.	Concentrated sulphuric acid is used as a drying agent	because	Sulphuric acid has a high affinity for water	
41.	Hydrochloric acid reacts faster with magnesium ribbon that magnesium powder	because	Magnesium powder provides a greater surface area of contact	
42.	A mixture of ammonium chloride and sodium chloride can be separated by sublimation	because	The salts have a common anion	
43.	Elements of group (I) of the periodic table are very electro positive	because	Their valency electrons and strongly attracted by the nucleus.	
44.	When copper (II) sulphate solution is electrolysed using copper electrodes, the intensity of the blue colour remains unchanged	because	No copper ions leave the solutions as copper	
45.	Galvanised iron does not rust	because	Zinc forms a protective layer on the surface of iron	

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

46. When copper powder is added to a solution zinc sulphate.
1. a black solid is formed
2. A grey solid is formed
3. The solution fades in colour
4. No reaction takes place

47. The following are the main sources of water pollution.
1. Sewage
2. Photosynthesis
3. Detergents
4. Rain water

48. The element X has atomic number 7. The element;
1. Hasrelative atomic mass 7
2. Is a non – metal
3. Has two electrons in the outermost shell
4. Reacts by gaining of electrons

49. The observation (s) made when a burning magnesium ribbon is plugged into a jaw of carbon dioxide is / are
1. Bright light
2. White ash
3. Black solid
4. Colourless gas

50. Which of the substances below contain the same number of moles as $224cm^3$ of oxygen at s.t.p? (Molar gas volume at s.t.p = $22.4dm^3$)
1. $30cm^3$ of 0.6m HCl
2. $2.4dm^3$ of $HCl_{(g)}$ at room temperature
3. 3.64g of PbO (Pb = 207, O = 16)
4. 0.32 of oxygen gas

END