541/1
CHEMISTRY
PAPER 1

1 ½ Hours

UGANDA CERTIFICATE OF EDUCATION
MOCK EXAMINATIONS
CHEMISTRY
PAPER 1
1HOUR 30MINUTES

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 Din the box provided on the right hand side against each question

Do not use pencil

FOR EXAMINERS' USE ONLY	

1. The formula of the sulphate of element M is M_2SO_4 . The value of n in the formula M^{n+} is likely to be
   A. 2 B. 3 C. 0 D. 1

2. Which on the following mixtures of gases is explosive?
   A. Methane and hydrogen
   B. Hydrogen and oxygen
   C. Oxygen and methane
   D. Nitrogen and hydrogen

3. Which one of the following substances is formed when ethene completely burns in oxygen?
   A. Soot and water B. Carbon monoxide and water
   C. Carbon dioxide and water D. Carbon dioxide and soot

4. Copper(II) chloride solution reacts with sodium carbonate solution according to the ionic equation: $Cu^{2+}(aq) + CO_3^{2-}(aq) \longrightarrow CuCO_3(s)$
   The mass of Copper(II) precipitated when $20cm^3$ a solution containing 5.3g of sodium carbonate n $500cm^3$ if solution is reacted completely with the copper(II)chloride is given by the expression.
   (Cu=64, Cl=35.5, O=16, Na=23, C=12)
   A. $\left(\frac{5.3 \times 20x \ 124}{106 \times 500}\right)$ g
   B. $\left(\frac{5.3 \times 124 \times 500}{20 \times 106}\right)$ g
   C. $\left(\frac{20 \times 106 \times 124}{500 \times 5.3}\right)$ g
   D. $\left(\frac{20 \times 124 \times 5.3}{106 \times 1000}\right)$ g

5. The reactivity of the element M, Magnesium and N is M, Mg, N. Which one of the following statements is true?
   A. $N(s) + M^{n+}(aq) \longrightarrow N^{2+}(aq) + M(s)$
   B. Magnesium and N react with cold water
   C. Magnesium and N react with steam
   D. Magnesium and M react with steam

6. The reaction between concentrated sulpuric acid and glucose is described as
   A. A dehydration reaction B. An oxidation reaction
   C. A displacement reaction D. A neutralization reaction

7. Which one of the following mixtures can be separated by applying heat to the mixture?

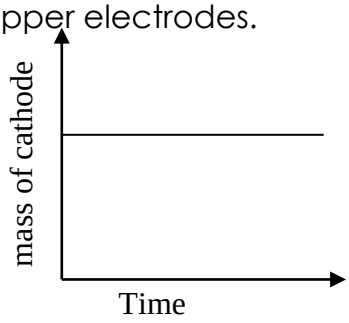
A. Iodine and sand
B. sugar and sand
C. Sand and Iron fillings
D. Sulphur and iron feelings

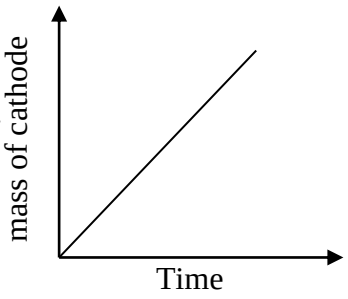
8. Which one of the following contains the same number of moles of ammonium ions as a solution containing 1.32g of ammonium sulphate in 100cm^3 of solution. [N=14, H=1, S=32,O=16]
   A. 10 cm^3 of 0.1M ammonium nitrate
   B. 20 cm^3 of 0.1M ammonium nitrate
   C. A solution containing 0.8g ammonium chloride per 100 cm^3.
   D. A solution containing 0.107g ammonium chloride per 100 cm^3.

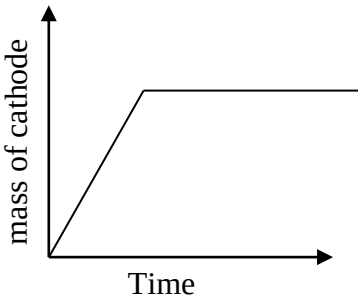
9. What will be the molar heat of combustion of graphite if 1.2g of graphite yielded 39.4kJ of heat?
A. 394 kJmol^{-1}
B. -3.94 kJmol^{-1}
C. + 3.94 kJmol^{-1}
D. + 394 kJmol^{-1}

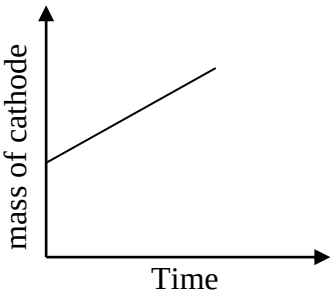
10. Which one of the following pairs of substances dissolves in water evolving heat?
   A. Sulphuric acid and sodium hydroxide.
   B. Ammonia and Sulpuric acid
   C. Sodium hydroxide and Ammonia
   D. Ammonia and hydrochloric acid

11. Which one of the following graphs describes the change in mass of the cathode during the electrolysis of copper(II) sulphate solution using copper electrodes.

A.


B.


C.


D.


12. Complete combustion of a hydrocarbon X yielded 8.8g of carbon dioxide and 3.6g of water. The mass of X burnt was
    A. 2.8g B. 1.4g C. 3.6g D. 8.8g

13. Which one of the following reagents is used to test for gases?
A. Silver nitrate solution
B. Barium chloride solution
C. Potassium dichromate solution
D. Hydrogen chloride solution

1. The substance that does not cause air pollution is:-
A. Carbondioxide
B. Sulphurdioxide
C. Hydrogen Sulphide
D. Water vapour

2. Which one of the following is not a property of ammonia?
A. An alkaline gas
B. A reducing agent
C. Soluble in water
D. Denser than air

3. Which one of the following structures has a giant ionic structure?
A. Sodium chloride
B. Carbondioxide
C. Hydrogen chloride
D. Diamond

4. During vulcanicity of rubber, Sulphur is added to:-
A. Lower melting point of Sulphur
B. From strong elastic bonds with carbon atoms
C. Make rubber pure
D. Make rubber appear better

5. The metal which can be extracted from its ore only by electrolysis is:-
A. Zinc B. Copper C. Iron D. Magnesium

6. 5.3KJ of heat energy are required to vapourize 13g of a liquid X if molar mass 78. The molar heat of vaporization of X in $kJmol^{-1}$ is:-
A. $\frac{5.3\times 78}{13}$ B) $\frac{13\times 78}{5.3}$ C) $13\times 5.3\times 78$ D) $\frac{5.3\times 13}{78}$

7. The rate of the chemical reaction between magnesium and dilute hydrochloric acid can be determined by measuring the
A. Concentration of hydrogen produced
B. Temperature of hydrogen produced
C. Volume of hydrogen produced
D. Pressure of hydrogen produced

8. Carbonmonoxide reacts with hydrogen according to the equation:-
$CO(g)+2H_2(g) \longrightarrow CH_3OH(l) \quad \Delta H = 91kJ$

What mass of Carbonmonoxide would cause a heat change of +82kJ? (C=12, O=16)

A. 2g B. 28g C. 56g D. 273g

9. The equations below show reactions between elements X, Y and Z.

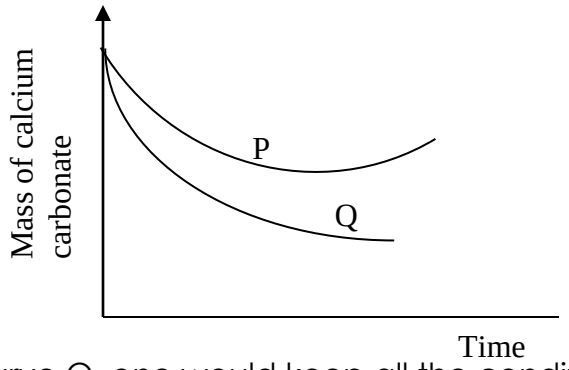
i) $Z(s) + X^{2+}(aq) \longrightarrow Z^{2+}(aq) + X(s)$

ii) $Y(s) + Z^{2+}(aq) \longrightarrow Y^{2+}(aq) + Z(s)$

The order of reactivity of the elements starting with the least reactive is

A. X,Z,Y B.Y,X,Z C. Y,Z,X D.Z,Y,X

10. Curve P in the graph below shows the variation in mass of calcium carbonate powder with time when it is reacted with excess hydrochloric acid at room temperature.



To obtain curve Q, one would keep all the conditions the same except;

A. Increase the concentration of the acid
B. Increase the mass of the carbonate powder
C. Reduce the temperature
D. Use the same mass of marble chips

11. Which one of the following gases can cause greenhouse effect?

A. Nitrogen B. Oxygen C. Carbonmonoxide D. Carbondioxide

12. One of the following substances reacts with ammonium Sulphate to form a white precipitate.

A. Silver nitrate
B. Sodium Hydroxide
C. Hydrochloric acid
D. Barium Chloride

13. A white solid R was kept in an open container. After some days, the solid became liquid R is likely to be

A. Calcium oxide
B. Magnesium hydroxide
C. Fused calcium chloride
D. Sodium carbonate crystals

14. Which one of the following substances is an example of an allotropic element?
A. Copper B. Bronze C. Sulphur D. Solder

15. The solubility of copper (II) Sulphate at 30^0c is 25g per 100g of water. The mass of copper (II) Sulphate that would crystallize in a solution containing
A. 12.5g B. 25.0g C. 50.0g D. 75.0g

16. Sulphurdioxide reacts with oxygen to form sulphur trioxide according to the equation $SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g) + heat$

Which one of the following conditions favour the formation of Sulphur trioxide?
A. Low pressure and low temperature
B. High pressure and high temperature
C. Low pressure and high temperature
D. High pressure and low temperature

17. Which one of the following contains the same number of atoms as 8g of Sulphur? (C= 12, S= 32, Ca=40)
A. 20g calcium C. 12g Carbon
B. 10g Calcium D. 4g Carbon

18. Which one of the following acids decomposes when heated?
A. Carbonic acid C. Hydrochloric acid
B. Nitric acid D. Sulphuric acid

19. Chlorine gas was bubbled into water the mixture exposed to sunlight. The observation made was
A. Bubbles of a colorless gas
B. Greenish- yellow solution was formed.
C. Bubbles of a colorless gas which fumes in moist air.
D. A solution which turns red litmus blue

20. When a mixture of sodium hydroxide and solution X is warmed, a colourless gas is evolved. X contains
A. NH_4^+ B. Al^{3+} C. Zn^{2+} D. Pb^{2+}

21. What volume of 0.1M potassium iodide will precipitate 4.62g of lead iodide when added to lead nitrate solution? [Pb=208, I=127]
$Pb(NO_3)_2(aq) + 2KI(aq) \longrightarrow PbI_2(s) + 2KNO_3(aq)$
A. $15cm^3$ B. $100cm^3$ C. $200cm^3$ D. $50cm^3$

22. Dilute sodium hydroxide was electrolyzed using graphite electrodes. The product formed at the positive electrode was:-
A. Sodium
B. Hydrogen
C. Oxygen
D. Oxygen and Hydrogen

23. When sodium hydroxide solution was added to an aqueous solution X, a white precipitate soluble in excess sodium hydroxide was formed. When ammonia solution was added, there was no observable change. The likely cations in X are:-
A. Ca^{2+}, Ba^{2+}, Al^{3+}
B. Al^{3+}, Pb^{2+}, Zn^{2+}
C. Al^{3+}, Pb^{2+}
D. Mg^{2+}, Al^{3+} , Pb^{2+}

24. A mixture of solid Z and concentrated sulphuric acid evolved a colourless gas which furmed in moist air. Z is likely to be:-
A. Carbonate
B. Sulphate
C. Sulphite
D. Chloride

25. Which one of the following is utilized when separating a mixture of sodium carbonate and sodium hydrogen carbonate?
A. Difference in boiling points
B. Difference in solubility
C. Difference in molecular mass
D. Difference in melting point

26. Which one of the following reactions is a neutralization reaction.
A. $MgO(s) + HCl(aq) \longrightarrow MgCl(aq) + H_2O(l)$
B. $Mg(s) + 2HCl(aq) \longrightarrow MgCl_2(aq) + H_2(g)$
C. $CuSO_4(aq) + 2NaOH(aq) \longrightarrow Cu(O)_2(s) + Na_2SO_4(aq)$
D. $H_2(g) + Cl_2(g) \longrightarrow 2HCl(g)$

27. Ammonia reacts with Copper (II) Oxide according to the following equation.
$2NH_3(g) + 3CuO(s) \longrightarrow 3H_2O(l) + N_2(g) + 3Cu(s)$
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; 1 mole of gas occupies 22.4dm^3 at s.t.p]
A. 3.3 dm^3
B. 2.52 dm^3
C. 1.68 dm^3
D. 1.12 dm^3

Each of the questions 41 to 50 consists of an assertion (statement) on the left hand side and a reason on the right hand side.
Select

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

B. If both the assertion and the reason are true statements but 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.

Summary of Instructions

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

28. Electrolysis of bromine using graphite electrodes yields chlorine at the positive electrode	***Because***	Chloride ions are discharged at the positive electrode
29. The same volume of hydrogen gas is evolved when equal volumes of 2m hydrochloric acid and 1m sulphuric acid are reacted with the same mass of magnesium	***Because***	Both hydrochloric acid and sulphuric acid are strong acids
30. Iron is extracted from its ore by heating with coke	***Because***	Carbon is a stronger reducing agent than iron
31. When hydrogen chloride gas is bubbled into potassium iodide solution, a brown solution is formed.	***Because***	Chlorine displaces Iodine from its aqueous solution
32. When a piece of phosphorous is lowered into a jar of chlorine, white fumes are observed.	***Because***	Hydrogen chloride is formed during the reaction

In each of the questions 40 to 45, one or more answers given may be correct. Indicate the correct answer A, B, C or D 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

INSTRUCTIONS SUMMARIZED

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

33. Which of the following anions will be precipitated when Barium nitrate is added to a solution containing ions?
    1. SO_4^{2-}
    2. Cl^-
    3. CO_3^{2-}
    4. O^{2-}

34. Chlorine gas was bubbled through a cold solution of sodium hydroxide. The resultant solution contained
    1. OCl^{-1}
    2. Cl^-
    3. Na^+
    4. ClO_3^- and OH^-

35. Which of the following is/ are true about electroplating Iron with silver?
    1. Silver nitrate solution is used as electrolyte
    2. Silver is made the anode
    3. Iron is made the cathode
    4. Iron (II) Sulphate solution is used as electrolyte

36. Descending down the group of the periodic table,
    1. Atomic number increases
    2. Number of shells increases
    3. Ionic radius increases
    4. Non- metallic character increases

37. The following is/ are correct about polythene
    1. It is a thermo softening plastic
    2. It is a thermo setting plastic
    3. It is hydrocarbon
    4. It conducts heat and electricity