**Name……………………………………………………………………………..…… Index No………………………..……..**

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**545/1**

**CHEMISTRY**

**Paper 1**

**Jul/Aug 2019**

**1½ Hours**



**MUKONO EXAMINATION COUNCIL**

**Uganda Certificate of Education**

**CHEMISTRY**

Paper 1

**1 Hours 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.*

|  |
| --- |
| **For Examiner’s Use Only** |
|  |

1. The best method that can be used to separate a mixture of sim sim oil and water is;
2. separating funnel
3. chromatography
4. filtration
5. crystallization
6. Which one of the following ions makes water hard?
7. Na+(aq)
8. (aq)
9. HCO3-(aq)
10. Mg2+(aq)
11. Which one of the following cations when in solution forms an insoluble salt with sodium sulphate solution?
12. Al 3+
13. NH4+
14. Zn2+
15. Pb2+
16. Which one of the following substances will dissolve in water to give a solution that turns litmus blue?
17. CH3CH2OH
18. NaCl
19. Na2CO3
20. K2SO4
21. Which one of the following is a characteristic of the element with electronic configuration 2:4?

A: forms ions by electron loss

B: will form an acidic and a neutral oxide

C: does not conduct electricity

D: dissolves in a concentrated acid to give a salt and water

1. Which one of the following is observed when magnesium is burnt with nitrogen?
2. A white solid is formed
3. A silvery grey solid is formed
4. A yellow solid is formed
5. A grey solid is formed.
6. Which one of the following hydrocarbons is unsaturated?
7. C2H6
8. C3H6
9. C3H8
10. C4H10
11. 2.40g of magnesium reacted completely with excess hydrochloric acid. Magnesium reacts with hydrochloric acid according to the following equation;

Mg(s) + 2HCl(aq) MgCl2(aq) + H2(g)

The maximum decrease in mass in this reaction is ………

A: 2.24g B: 2.40g C: 0.20g D: 0.02g

1. Which one of the following allotropes of carbon is used in the extraction of iron?
2. Coal
3. Coke
4. Charcoal
5. Diamond
6. Which one of the following salts can be prepared by direct synthesis method?
7. Al 2(SO4)3
8. CuSO4
9. FeS
10. MgSO4
11. Which one of the following oxides is soluble in both dilute acid and dilute alkali?
12. Calcium oxide
13. Copper (II) oxide
14. Aluminium oxide
15. Magnesium oxide
16. When chlorine gas is bubbled through iron (II) sulphate solution,

A the brown solution remains

B a yellow solution is formed

C the green solution turns black

D the brown solution turns green

1. Which one of the following will displace Copper from Copper (II) sulphate solution?
2. lead
3. Silver
4. Mercury
5. Gold
6. Which one of the following substances will not oxidize concentrated hydrochloric acid to chlorine?
7. Potassium manganate (VII)
8. Lead (IV) oxide
9. Manganese (IV) oxide
10. Lead (II) oxide.
11. Which one of the following is observed when concentrated nitric acid is boiled with iron (II) sulphate solution? The colour of the solution changes from
12. yellow to brown
13. brown to green
14. green to brown
15. green to colourless
16. Which one of the following substances is used both as a catalyst and an oxidizing agent?

A copper (II) sulphate B finally divided iron

C Vanadium (V) oxide D manganese (iv) oxide

1. The formula of a compound is XPO4. The electronic configuration of X in the compound is
2. 2:8
3. 2:8:3
4. 2:8:4
5. 2:8:5

1. Which one of the following substances is a mixture containing tin?
2. Bronze
3. Brass
4. Steel
5. solder
6. 1.74gm of an oxide of formula ZxO is found to contain 0.02moles of oxygen. The value of X is (Z=35.5)

A) 7 B) 2 C) 4 D) 1

1. Which of the following metals forms a nitrate which on heating gives a nitrite as one of the products?

A lead B silver

C sodium D aluminium

1. Which of the following pairs of elements will combine together to form a compound of simplest formula YX2?

|  |  |  |
| --- | --- | --- |
|  | Atomic number of Y | Atomic number of X |
| A  B  C  D | 18  11  9  20 | 9  17  19  9 |

1. Which one of the following substance (s) is /are formed at the anode when potassium iodide solution is electrolyzed using graphite electrodes?
2. Water and oxygen
3. potassium and hydrogen
4. iodine only
5. potassium only
6. Hydrogen sulphide gas burns in oxygen according to the equation;

2H2S(g) + 3O2(g) 2H2O(g) + SO2(g)

The volume of oxygen, at the same temperature and pressure, used up when 14.4 litres of hydrogen sulphide are completely burned at s.t.p is.

A: 7.2 litres B: 21.60 litres C: 43.2 litres D: 9.6 litres

1. Which one of the following elements forms hydrogen with 0.01M nitric acid?
2. Magnesium
3. Iron
4. Zinc
5. Copper
6. The gas which when passed over strongly heated iron can oxidize the iron to iron (II) only is
7. oxygen
8. chlorine
9. carbon monoxide
10. hydrogen chloride
11. The percentage of water of crystallization in iron (II) sulphate, FeSO**4**.7H**2**O) is:

A. B.

C. D.

1. The substance that can react with water at room temperature is;
2. Magnesium
3. Calcium
4. Iron
5. Zinc
6. Which one of the following substances when added to distilled water would make it consume a lot of soap during washing?

A sodium hydrogen carbonate B potassium sulphate

C calcium sulphate D sodium carbonate

1. A solution of copper(II) sulphate is electrolyzed using copper electrodes. The product at the positive electrode is;
2. hydrogen
3. potassium
4. oxygen
5. copper(II) ions
6. Which one of the following salts can be prepared from its elements by direct synthesis?
7. Potassium sulphate
8. Copper (II) carbonate
9. Iron (II) sulphide
10. Lead (II) nitrate
11. When 1.0g of carbon is burnt in excess oxygen, the heat produced raises the temperature of 400g of water by 19°C. The heat of combustion of carbon is

(C =12, S.H.C of water = 4.2KJKg-1K-1)

1. 0.4 x 4.2 x 19 x 12 KJMol-1
2. 400 x 4.2 x 19 x 12 KJMol-1
3. KJmol-1
4. KJmol-1
5. The trend which is observed on moving from left to right across a period in the periodic table is that the;
6. metallic character increases
7. number of energy levels decreases
8. non-metallic character increases
9. number of energy levels increase
10. Which one of the following cations when in solution reacts with excess ammonia solution and forms a white precipitate?

A. Cu**2+** B. Zn**2+** C. Fe**2+** D. Al**3+**

1. 15cm3 of a dibasic acid was neutralized by 30cm3 of a 0.4M potassium hydroxide solution. The molarity of the acid is?

A. B.

C. D.

1. Which one of the following polymers can be remoulded
2. Rubber
3. Nylon
4. Polyester
5. Polyethene
6. Which one of the following factors does not affect the selection of an ion that is discharged at the electrodes during electrolysis?
7. Reactivity of the metal
8. Nature of electrode
9. Surface area of electrode
10. Concentration of electrolyte
11. Which one of the following substances is not used in the softening of water?
12. Chlorine
13. Permutit
14. Sodium carbonate
15. Calcium hydroxide
16. The table below shows the atomic mass, atomic number and number of neutrons in the nucleus of the atoms M, Q, R and T.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Atom** | **M** | **Q** | **R** | **T** |
| Atomic mass | 29 | 31 | 12 | 13 |
| Atomic number | 13 | 15 | 6 | 6 |
| Number of neutrons | 16 | 16 | 6 | 7 |

Which one of the following pairs of atoms belongs to the same element?

1. M and Q
2. M and T
3. R and T
4. Q and T
5. 15g of an oxide of lead is strongly heated in a stream of hydrogen gas, leaving 13g of metallic lead. Determine the empirical formula of the oxide of lead.

A. PbO B. PbO3

C. PbO2 D. Pb2O3

1. The substance which does not produce carbon dioxide when heated strongly is
2. Sodium hydrogencarbonate
3. Potassium hydrogencarbonate
4. Sodium carbonate
5. Calcium carbonate

**Each of the questions 41 to 45 consists or 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 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** |
| 1. True | True (Reason is a correct explanation |
| 1. True | True (Reason is not a correct explanation) |
| 1. True | Incorrect |
| 1. Incorrect | Correct |

1. Ammonia gas can be ***because*** It is less dense than air.

collected by upward delivery

during preparation

|  |  |  |
| --- | --- | --- |
| 1. An element with atomic number 20 belongs to group (II) of the periodic table | ***because*** | It is a metallic element |

1. During the manufacture of chlorine by ***because*** chlorine gas is soluble in

electrolysis of brine, the cathode is made water

of iron.

|  |  |  |
| --- | --- | --- |
| 1. Concentrated sulphuric acid is commonly used as a drying agent | ***because*** | The acid is hygroscopic |

1. Coke is used to extract iron ***because*** Coke is an oxidising agent

from its ore.

**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.**

1. If 1, 2 and 3 only are correct.
2. If 1 and 3 only are correct
3. If 2 and 4 only are correct
4. If 4 only is correct.
5. Which of the following is used to test for water of crystallization?
6. Copper (II) sulphate
7. Potassium dichromate
8. Cobalt (II) chloride
9. Potassium permanganate
10. Carbon is similar to Sulphur in that both
11. are non-metallic solids
12. exists in allotropic forms
13. form covalent compounds
14. form neutral oxides
15. The atomic number of an element **X** is 15. The formulae of the compound(s) that can be formed when **X** reacts with chlorine is/are



20. Which one of the following nitrate(s) when heated strongly will give off brown gas?
21. Copper nitrate
22. Potassium nitrate
23. Lead nitrate
24. Ammonium nitrate
25. Which of the following compounds, when dissolved in the solvent indicated will form a solution(s), which is/are (an) electrolyte(s).
26. Ethanol in water
27. Hydrogen chloride in aqueous ammonia.
28. Hydrogen chloride in methyl benzene
29. Nitrogen dioxide in water

***END***