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

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

**545/1**
**CHEMISTRY**
**Paper 1**
**July/August**
1 ½ hours

# WAKISSHA JOINT MOCK EXAMINATIONS

## 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* |
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| |

1. Which one of the following is an example of a physical change?
   A. Burning a piece of charcoal.
   B. Heating copper (II) carbonate strongly.
   C. Heating sodium carbonate strongly.
   D. Burning of magnesium ribbon.

2. Which one of the following solvents is suitable for extracting oil from castor oil seeds?
   A. Water.
   B. Sulphuric acid.
   C. Sodium chloride solution.
   D. Acetone.

3. Which one of the following compounds can be used to identify water vapour in the laboratory?
   A. Potassium chloride.
   B. Cobalt chloride.
   C. An hydrous chloride.
   D. Calcium chloride.

4. Bases react with acids to form a salt and water only. Which one of the following is not a base?
   A. $PbO_2$
   B. $M_gO$
   C. $C_aO$
   D. $N_aOH$

5. Which one of the following methods can be used to separate iodine from sulphur in iodine – sulphur mixture?
   A. Crystallization.
   B. Sublimation.
   C. Distillation.
   D. Evaporation.

6. Which one of the following hydroxides is **NOT** amphoteric?
   A. Aluminum hydroxide.
   B. Lead(II) hydroxide.
   C. Zinc hydroxide.
   D. Magnesium hydroxide.

7. Ammonia reduces copper(II) oxide according to the equation.
   $3C_uO_{(s)} + 2NH_{3(g)} \longrightarrow 3Cu_{(s)} + 3H_2O_{(g)} + N_{2(g)}$
   The mass of copper (II) oxide required to produce $448cm^3$ of nitrogen gas at s.t.p is ....
   (Cu = 63.5; O = 16; 1 mole occupies $22400cm^3$ at s.t.p)
   A. $\frac{3\times79.5\times448}{22400}$
   B. $\frac{79.5\times448}{3\times22400}$
   C. $\frac{79.5\times22400}{448\times3}$
   D. $\frac{3\times22400}{448\times79.5}$

Which one of the following nitrates will decompose on heating to form the metal oxide, nitrogen dioxide and oxygen.

A. Sodium nitrite.
B. Copper (II) nitrate.
C. Silver nitrate.
D. Ammonium nitrate.

9. Which one of the salts of lead is soluble in water?

A. Lead sulphate.
B. Lead (II) chloride.
C. Lead (II) nitrate.
D. Lead carbonate.

10. Which one of the following is a physical method of breaking hardness of water?

A. Addition of slaked lime.
B. Addition of washing soda.
C. Addition of aqueous ammonia.
D. Heating to obtain vapour and cooling the vapour.

11. Which one of the following ions will not form a precipitate when treated with aqueous ammonia.

A. $AL^{3+}$
B. $Pb^{2+}$
C. $Ca^{2+}$
D. $Mg^{2+}$

12. Which one of the following substances will **not** conduct electricity when in solution or molten state.

A. Sodium chloride.
B. Sodium hydioxide.
C. Iron(ii) chloride.
D. Ethanol.

13. Which one of the following organic compounds can be represented by the general formula $C_nH_{2n}$.

A. Ethene, propene and butane.
B. Ethane, propane and butene.
C. Ethene, propene and butene.
D. Ethane, propane and butane.

14. The atomic number of elements X, W, V and Y are 8, 12, 16, and 20 respectively. The elements that form ions by gaining elements are....

A. X and W
B. V and Y
C. W and Y
D. X and V

15. Which one of the following substances produces ammonia when reacted with ammonium chloride.

A. Potassium hydroxide.
B. Copper (II) oxide.
C. Nitric acid.
D. Hydrochloric acid.

16. Copper (II) ions form a deep blue solution when treated with excess ammonium hydroxide solution. The ion in the deep blue solution is

A. $Cu(OH)_4^{2+}$

B. $Cu(NH_3)_4^{2+}$

C. $Cu(OH)_4^{2-}$

D. $Cu(NH_3)_4^{2-}$

17. The electronic configuration atom of element Y is 2, 8, 1. Which one of the following elements belong to the same period as Y?

A. $^{40}_{20}M$

B. $^{7}_{3}W$

C. $^{39}_{19}R$

D. $^{24}_{12}X$

18. When 4.9g of sulphuric acid is dissolved in water to make $250cm^3$ of solution, the temperature rises by $3.39^0C$. (Density of solution = $1g/cm^3$, specific heat capacity of solution = $4.18J/g/^0C$, Mr of $H_2SO_4 = 98g$). Which one of the following is the heat of solution of sulphuric acid?

A. $\frac{98\times250\times4.18\times3.39}{4.9}$

B. $\frac{250\times4.18\times3.39}{98\times4.9}$

C. $\frac{98\times4.9}{250\times4.18\times3.39}$

D. $\frac{3.39\times98\times4.9}{250\times4.18}$

19. Which one of the following gases bleaches moist litmus paper?

A. Nitrogen dioxide.

B. Chlorine.

C. Hydrogen.

D. Carbon dioxide.

20. Which one of the following is the concentration in grams per litre of a solution containing 0.02 moles of sodium hydroxide in $25cm^3$ of a solution (Na = 23, O = 16 and H = 1)

A. $\frac{0.02\times40}{1000\times25}$

B. $\frac{1000\times0,02\times40}{25}$

C. $\frac{25\times40\times0.02}{1000}$

D. $\frac{25\times1000}{40\times0.02}$

When barium nitrate solution was added to solution W, a white precipitate was formed. The precipitate dissolved in nitric acid. Which one of the following ions was in solution W?

A. $CO_3^{2-}$

B. $SO_4^{2-}$

C. $Cl^-$

D. $SO_3^{2-}$

22. The mass of calcium hydroxide contained in $250cm^3$ of a 0.02M solution of calcium hydroxide is (Ca = 40, H = 1, O = 16).

A. $\frac{0.25\times72}{0.02}$

B. $\frac{0.25\times0.02}{72\times1}$

C. $\frac{72\times1}{0.25\times0.02}$

D. $0.25 \times 0.02 \times 72$

23. The gases evolved when copper (II) nitrate is strongly heated are....

A. Oxygen and nitrogen dioxide.
B. Oxygen and nitrogen monoxide.
C. Ammonia and nitrogen monoxide.
D. Ammonia and nitrogen dioxide.

24. Excess dilute hydrochloric acid was reacted with 1.95g of Zinc powder according to the equation; $Zn_{(s)} + 2HCl_{(aq)} \longrightarrow ZnCl_{2(aq)} + H_{2(g)}$
The maximum volume of hydrogrn gas evolved at room temperature and pressure was (Zn = 65, Molar volume of gas at r.t.p = $24000cm^3$) = 65, Molar volume of a gas at r.t.p = $24000cm^3$

A. $270\ cm^3$
B. $720\ cm^3$
C. $360\ cm^3$
D. $1440\ cm^3$

25. Which one of the following gases when bubbled through potassium dichromate solution will cause its colour to turn to green?

A. Hydrogen chloride.
B. Ethene.
C. Sulphur dioxide.
D. Nitrogen dioxide.

26. Which one of the following alloys contains Magnesium as one of its components?

A. Steel.
B. Bronze.
C. Duralumin.
D. Brass.

27. The purpose of adding lime stone to the blast furnace is to

A. provide a source of carbon dioxide.
B. reduce the iron(III) oxide to iron.
C. provide a source of calcium oxide.
D. lower the melting point of iron.

28. The percentage of sodium in washing soda.
($Na_2CO_3$) is Na = 23, C = 12, O = 16)

A. $\frac{106\times100}{46}$

B. $\frac{23\times100}{106}$

C. $\frac{46\times100}{106}$

D. $\frac{106}{23\times100}$

29. Which one of the following substances is used to alter the rate of formation of ammonia gas in the Haber process?
A. Vanadium (V) oxide.
B. Iron.
C. Manganese (iv) oxide.
D. Platinum.

30. The process leading to the formation of the substance $+ CH_2 - CH_2 +_n$ is called.
A. Catalytic cracking.
B. thermo cracking.
C. addition polymerisation.
D. condensation polymerisation.

31. During the electrolysis of acidified water, the ion discharged by oxidation is
A. $SO_4^{2-}$
B. $OH^-$
C. $H^+$
D. $Cl^-$

32. Which one of the following salts can be prepared by direct synthesis?
A. Ion (III) chloride.
B. Magnesium chloride.
C. Lead sulphate.
D. Zinc chloride.

33. Which one of the following substance is formed when magnesium burns in carbon dioxide?
A. Magnesium carbonate.
B. Magnesium carbide.
C. Carbon monoxide.
D. Carbon and magnesium oxide.

34. Which one of the following ions if present in water causes temporary hardness?
A. $HCO_3^-$
B. $HSO_4^-$
C. $CL^-$
D. $SO_4^{2-}$

35. Which one of the following particles conduct electricity in copper wire?
A. Molecules.
B. Atoms.
C. Ions.
D. Elections.

36. Which one of the following gases will produce dense white fumes when lowered near a wash bottle of concentrated hydrochloric acid?
A. Ammonia.
B. Hydrogen sulphide.
C. Hydrogen gas.
D. Hydrogen chloride.

37. Which one of the following processes does **NOT** release carbon dioxide?
A. Combustion of ammonia.
B. Respiration.
C. Fermentation.
D. Heating of calcium carbonate.

38. Which one of the following is a synthetic polymer?
A. Wool.
B. Nylon.
C. Silk.
D. Cotton.

39. Methane burns in oxygen according to the equation, $CH_{4(g)} \longrightarrow CO_{2(g)} + 2H_2O_{(g)}$.
The volume of oxygen required for the complete combustion of $30cm^3$ of methane is.
A. $15cm^3$
B. $30\ cm^3$
C. $45\ cm^3$
D. $60\ cm^3$

40. Which one of the following substances when dissolved in water produces hydrogen ions?
A. $Ca(OH)_2$
B. $CH_3COOH$
C. $NH_4OH$
D. $(NH_4)_2CO_3$

***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 |

41. In the preparation of dry ammonia gas, the gas is passed over calcium oxide, because ammonia is lighter than air.

42. Ethene is an unsaturated hydro carbon, because It's a compound of hydrogen and carbon only.

| | | | | |
|---|---|---|---|---|
| 43. | Chlorine bleaches moist red litmus paper, | because | hypochlorous acid is unstable so it gives away its oxygen. | |
| 44. | Hydrogen chloride gas conducts electricity when dissolved in water, | because | It's an alkaline gas. | |
| 45. | A mixture of ethanol and water can be separated by paper chromatography, | because | Ethanol and water have different boiling points. | |

***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 oxide(s) is/are neither acid nor basic?
1. Carbon monoxide.
2. Sulphur dioxide.
3. Dinitrogen oxide.
4. Carbon dioxide.

47. Which of the following is/are properties of sulphuric acid?
1. It dehydrate copper (II) sulphate.
2. It oxidises carbon and sulphur.
3. Conducts electricity when diluted.
4. It's used to dry ammonia gas.

48. Which of the following solution(s) has the same number of moles of $H^+$ ions as $20cm^3$ of IM nitric acid?
1. $40cm^3$ of 2M $HNO_3$.
2. $20\ cm^3$ of 0.5M $H_2SO_4$
3. $10\ cm^3$ of 1M $CH_3COOH$
4. $40\ cm^3$ of 0.5M HCl.

49. Which of the following is/are true about a solution of sodium carbonate in water?
1. The solution has a pH less than 7.
2. Forms a white precipitate when treated with barium nitrate.
3. Decolourises bromine water.
4. It reacts with nitric acid with effervescence.

50. Which of the following is /are properties of ethene gas?
1. Turns lime water milky.
2. Decolourises bromine water.
3. It's a saturated hydrocarbon.
4. Turns the colour of potassium permanganate from purple to colourless.

**END**