Name…… signature……

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545/1
Chemistry
Paper 1
July/August 2019
1 ½ hours

BUGANDA EXAMINATION COUNCIL MOCKS 2019

Uganda Certificate of Education

CHEMISTRY

PAPER 1

1 HOUR 30 MINUTES

INSTRUCTIONS TO CANDIDATES

- This paper consists of **fifty** objective type questions
- Answer all questions
- You are required to write the correct answer **A, B, C** or **D** in blue or black ink in the box provided on the right hand side of each question.
- Do not use pencil. Any question answered in pencil will not be marked.

FOR EXAMINERS USE ONLY

Turn over

1. Which one of the following processes takes place when aluminium chloride is heated?
   A. Sublimation.
   B. Vaporization.
   C. Melting.
   D. Boiling.

2. Which one of the following lead compounds will react with sodium carbonate to produce lead (II) carbonate?

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

3. The atoms of elements X, Y, W and Z form ions X^{+}, Y^{2+}, $W^{-}$and Z^{2-} respectively. Which one of the elements belongs to group I in the periodic table?
   A. Y
   B. W
   C. Z
   D. X

4. The electronic configuration of the atoms of the elements M, Q, R, and X are shown below;
   M (2:3), Q (2:8:2), R (2:1), X (2:5)

   Which one of the elements is in period 3 of the periodic table?
   A. X
   B. Q
   C. N
   D. R

5. The process by which large alkanes break down to form simpler alkanes of alkenes is known as
   A. Decomposition.
   B. Cracking.
   C. Polymerization.
   D. Hydrogenation.

6. Which one of the following is the best conductor of electricity?
   A. Aqueous ammonia.
   B. Aqueous sodium chloride.
   C. Aqueous tartaric acid.
   D. Aqueous ethanoic acid.

7. The reaction that leads to the formation of ethene from ethanol is called;
   A. Cracking
   B. Polymerization
   C. Decomposition
   D. Dehydration

8. The solubilities of salts W, X Y A and Z at 20^{0}C are given below

Salt	W	X	Y	Z
Solubility at 20g /100cm^3	54.6	74.5	36.0	179.0

Which one of salts crystallizes out fast when a mixture of the salts is separated by fractional crystallization?
   A. W
   B. X
   C. Y
   D. Z

9. Which one of the following is true about ethanoic acid? The acid
   A. Does not neutralize alkalis.
   B. Has a low solubility in water.
   C. Is monobasic.
   D. Consists largely of molecules in its aqueous solution.

10. Which one of the following elements burns in oxygen with a blue flame?
   A. P
   B. S
   C. Na
   D. Mg

11. Which one of the following compounds dissolves in water to form a solution that is acidic to litmus?
   A. Ammonia.
   B. ammonium sulphate
   C. Sodium carbonate.
   D. Calcium oxide.

12. Which one of the following is true about Bakelite?
   A. It is monomer.
   B. It does not soften on heating.
   C. It is made from rubber.
   D. It can be remoulded.

13. The reaction between carbon dioxide and sodium hydroxide solution is called;
    A. Dissolution
    B. Neutralization
    C. Precipitation
    D. Dehydration

14. Which one of the following statements is **NOT** correct?
    A. All insoluble salts are prepared by precipitation.
    B. Two soluble salts can be used to prepare an insoluble salt.
    C. Anhydrous iron (II) chloride can be obtained by reaction of iron with hydrogen chloride.
    D. Iron (III) chloride is prepared by reaction of dilute acid with iron metal.

15. The concentration of hydrogen ions in one litre of the solutions of some acids was measured.
    Which one of the following contained the highest concentration of hydrogen ions?
    A. Fuming sulphuric acid.
    B. 1M sulphuric acid.
    C. 2M ethanoic acid.
    D. 2M carbonic acid.

16. Water samples X and Y form scum with soap but on boiling only sample Y forms scum.
    Which one of the following statements is true?
    A. X contains sodium carbonate
    B. Y contains sulphate
    C. Y contains magnesium hydrogen carbonate only.
    D. X contains magnesium sulphate.

17. Which one of the following reacts with dilute sulphuric acid to produce a gas that burns in air?
    A. Magnesium
    B. Sodium sulphate
    C. Potassium hydrogen carbonate
    D. Magnesium carbonate

18. The formula of an ionic compound is $\mathbf{X_3\ Y_2}$.Which one of the following is the formula of the ion of element Y.
    A. Y^{3+}
    B. Y^{2-}
    C. Y^{3-}
    D. Y^{2+}

19. When 0.43g of hexane ($C_6 H_{14}$) was burnt, the heat produced raised the temperature of 100g of water from 24^0C to X^0C. Which one of the following is the value of X? (C=12, H=1, specific heat capacity of water =4.2 jg^{-10-1} C , molar heat of combustion of lexane=4163 ks mol^{-1}).

A. $24 + \frac{0.43X\ 4163}{86X100X4.2}$

B. $24 + \frac{(0.43\ X\ 4163\ X\ 1000)}{86\ X\ 100\ X\ 4.2}$

C. $\frac{(0.43\ X4163\ X\ 100)}{86\ X\ 1000\ X\ 4.2} - 24$

D. $\frac{(100\ x\ 4.2\ x\ 86)}{0.43 \qquad 4163}$

20. $50cm^3$ of 0.2M copper (II) sulphate solution at 20^0C was mixed with 1.0g of zinc powder and a maximum temperature of 30^0C was recorded. What is the heat of displacement of copper?

A. -136.5 kj mol^{-1}
B. -210.0 kj mol^{-1}
C. -390.3 kj mol^{-1}
D. -630.0 kj mol^{-1}

21. Which one of the following pairs of substances are produced when chlorine water is exposed to sunlight?

A. HCl and O_2
B. Cl and O_2
C. Cl and H_2O
D. HCl and H_2O

22. When solid X was reacted with concentrated sulphuric acid a gas that gives white fumes with ammonia was produced. The anion in X is;

A. 1^- B. Cl^- C. NO_3^- D. SO_3^{2-}

23. Elements W, X, and Y are metals. W reduces the oxide of X but does not reduce the oxide of Y. Which one of the following is the descending order of strengths of the metals as reducing agents?

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

24. Elements J and M have 6 and 4 electrons in their outer most shells respectively. The compound formed when J combines with M will,

A. Consist of ions only.
B. Be soluble in water.
C. Have a formula of J_2M_3.
D. Have a low melting point.

25. Which of the following reactions take place at the cathode during electrolysis of copper (II) nitrate solution using copper as the anode and iron as the cathode?

A. $Fe(s) \rightarrow Fe^{2+}(aq) + 2e$
B. $2H^+(aq) + 2e \rightarrow H_2(g)$
C. $Cu^{2+}(aq) + 2e \rightarrow Cu(s)$
D. $4^- OH(aq) \rightarrow 2H_2O(l) + O_2(g) + 4e$

26. The number of oxygen molecules in 0.4g of oxygen is (1 mole contains 6.02×10^{23} particle, 0= 16)

A. $\frac{6.02 \times 10^{23} \times 0.4}{32}$
B. $\frac{6.02 \times 10^{23} \times 0.4}{16}$
C. $\frac{6.02 \times 10^{23} \times 32}{0.4}$
D. $\frac{6.02 \times 10^{23} \times 2 \times 0.4}{16}$

27. Magnesium reacts with hydrochloric acid according to the following equation. $Mg(s) + 2HCL(aq) \longrightarrow MgCL_2(aq) + H_2(g)$. What is the volume of hydrogen produced at s.t.p, If 0.72g of magnesium was added to excess hydrochloric acid? (Mg=24, 1 mole of gas occupies 22.4 dm^3 at s.t.p)

$\left(\frac{0.72 \times 22.4}{24}\right) dm^3$

A. $\left(\frac{0.72 \times 2 \times 22.4}{24}\right) dm^3$

B. $\left(\frac{0.72}{22.4 \times 24}\right) dm^3$

C. $\left(\frac{22.4 \times 2}{0.72 \quad x}\right) 24\ dm^3$

28. $26cm^3$ of 0.3M sulphuric acid reacted with $23cm^3$ of sodium hydroxide solution. The molarity of the sodium hydroxide is;

A. $\frac{(2 \times 0.3 \times 26)}{23}$ M

B. $\frac{(23 \times 0.3)}{26}$ M

C. $\frac{(0.3 \times 26)}{23}$ M

D. $\frac{(26 \times 0.3)}{2 \times 23}$ M

29. Magnesium nitride reacts in water according to the following equations.
$Mg_3N_2\ (s) + 6H_20_{(l)} \rightarrow 3Mg\ (OH)_2\ (s) + 2NH_3(g)$

The mass of magnesium hydroxide formed when 2.5g of magnesium nitride reacts with excess water is;(mg =24, N=14, O=16, H=1)

A. $\frac{[2.5 \times 58]}{[100 \times 3]}$ g

B. $\frac{[100 \times 2.5]}{58 \times 3}$ g

C. $\frac{[2.5 \times 58 \times 3]}{100}$ g

D. $\frac{[2.5 \times 58]}{100}$ g

30. Methane burns in oxygen according to the following equation.
$CH_4\ (g) + 2O_2\ (g) \rightarrow CO_2\ (g) + 2H_2O\ (g)$
$10cm^3$ of methane was burnt in $30cm^3$ of oxygen with and the residual gas cooled. Which one of the following was the volume of the gas that remained?

A. $40cm^3$
B. $20cm^3$
C. $30cm^3$
D. $15cm^3$

31. The atomic numbers of two elements W and V are 20 and 17 respectively. Which one of the following is not a property of the compound formed when W react with V?
The compound
A. Has high melting point.
B. Is a solid at room temperature
C. Does not conduct electricity in solid form.
D. Does not dissolve in polar solvents.

32. Which one of the following particles in atoms $^{39}_{19}x$ and $^{40}_{20}y$ are the same?

A. Neuclons
B. Protons
C. Neutrons
D. Electrons

33. Which one of the following reagents is used to test for ethene?
A. Lime water
B. Bromine water
C. Potassium iodide solution
D. Acidified potassium dichromate solution.

34. In which of the following processes is nitrogen used?
A. Manufacture of ammonia
B. Manufacture of wood pulp.
C. Food processing.
D. Manufacture of dyes.

35. An element R is a strong reducing agent and forms an ionic compound with group (VII) element. To which group in the periodic table does R belong?
A. I
B. IV
C. V
D. VI

36. Which one of the following statements is true about electrolyte?
A. They are composed of molecules
B. They contain mobile electrons
C. They consists of ions
D. They all contain water.

37. Crude oil can be separated into its components because the components have different;
A. Solubilities
B. Boiling points
C. Melting points
D. Densities.

38. When 2M solutions of acids A and B were separately added to sodium carbonate, acid A gave a vigorous effervescence more readily than B.
Which one of the following is true about acid A? It
A. Dissociates completely
B. Has a higher basicity
C. Is more concentrated
D. Is an organic acid.

39. Which one of the following is the precipitate formed when hydrogen sulphide is bubbled into lead (II) nitrate solution?
A. Lead metal
B. Lead (II) sulphate
C. Lead (II) sulphide
D. Lead (II) sulphite

40. Ethene can undergo addition polymerization because it;
A. Is a monomer
B. Has a double bond
C. Is a simple molecule
D. Has more than one carbon atom.

41. The disadvantage of phosphates in soapless detergents is that they;
A. Make water hard
B. Encourage algae growth
C. Reduce PH of water
D. Are non-biodegradable.

42. Which one of the following elements reacts with oxygen to form a black substance?
A. Zinc
B. Lead
C. Copper
D. Magnesium

Each of the questions 41 to 45 consists of an ascertain (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 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 SUMMARISED

Assertion	Reason
A. True	True (reasons is a correct explanation)
B. True	True (reasons is not a correct explanation)
C. True	Incorrect
D. Incorrect	correct

43. Heating a mixture of ammonium Chloride and sodium nitrate produces ammonia **because** ammonium chloride is a salt of ammonia

42. $10cm^3$ of a 0.1M sulphuric acid would react faster with magnesium ribbon than $10cm^3$ of 2M hydrochloric acid. **because** sulphuric acid is a stronger acid Hydrochloric acid

43. An iron nail placed in a boiling tube containing a mixture of boiled water and oil does not rust **because** oil and water are immiscible liquids

44. Concentrated sulphuric acid is not used to dry Chlorine gas **because** sulphuric acid is a strong acid

45. Sodium is extracted by electrolysis of aqueous sodium chloride **because** aqueous sodium chloride is an electrolyte.

In each 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 and 3 only are correct
B. If 1and 3 only are correct
C. If 2 and 4 only are correct
D. If 4 only is correct

46. Which of the following reactions (s) produce (s) a gas which turns acidified potassium dichromate from orange to green?
    1. Burning sulpur in air
    2. Heating a mixture of sodium sulphite and sulphuric acid
    3. Heating a mixture of sodium hydrogen sulphite and sulphuric acid
    4. Heating a mixture of sodium chloride and concentrated sulphuic acid

47. Which of the following statement(s) is/ are true about the Daniell call?
    1. Electrons flow from the copper electrode to the zinc electrode.
    2. Current flows from the zinc electrode to the copper electrode.
    3. The zinc electrode is the anode
    4. Copper (II) ions are reduced to copper.

48. Which of the following metal ions react (s) with sodium hydroxide solution to form complex salt(s)?
    1. Al^{3+}
    2. Pb^{2+}
    3. Zn^{2+}
    4. Fe^{3+}

49. Which one of the following particles has the same electronic structure as Cl^- ?
    1. F^-
    2. K^+
    3. Ne
    4. Ar

50. The substances (s) formed when sodium hydrogen carbonate is strongly heated is / are
    1. Water
    2. Carbon dioxide
    3. Sodium carbonate
    4. Sodium oxide

END