Name……..…… Index No……..……..
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545/1
CHEMISTRY
Paper 1
Jul/Aug 2017
1½ Hours

RESOURCEFUL MOCK 2017
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. Steel is a mixture of iron,……..
   A. Nickel and Chromium B. Zinc and Copper
   C. Iron and Copper D. Zinc and Tin

2. Which of the following is not a neutral oxide?
   A. CO B. H_2O
   C. NO D. NO_2

3. The element most likely to remove oxygen from Zinc oxide when a mixture of the oxide and element is heated is
   A. Lead B. Magnesium
   C. Copper D. Iron

4. Which of the following anions forms a white precipitate with barium nitrate solution soluble in nitric acid
   A. SO_4^{2-} B. CO_3^{2-} C. Cl^- D. NO_3^-

5. Atomic number of an element R is 13, the electronic configuration of the ion of R is
   A. 2 : 8 : 8 B. 2 : 8 : 5
   C. 2 : 8 : 3 D. 2 : 8

6. The reaction between two substances is exothermic. Which of the following is mostly likely to slow down the rate of reaction?
   A. Increasing the temperature of the surrounding
   B. Placing the reagent in an ice bath
   C. Having an excess of one of the reagents
   D. Removing the products as fast as they are formed.

7. Which of the following mixtures can be separated by filtration?
   A. $CuSO_4$ and $ZnCl_2$ B. $PbSO_4$ and $BaCO_3$
   C. AgCl and Na_2SO_4 D. K_2CO_3 and $Ca(NO_3)_2$

8. What is observed when dry nitrogen is passed over heated magnesium ribbon?
   A. White fumes B. Brown fumes
   C. Colourless gas D. White powder

9. In which of the following reactions is chlorine acting as an acidic gas
   A. $2Fe_{(s)} + 3Cl_{2(g)} \longrightarrow 2FeCl_3$
   B. $2Na_{(s)} + Cl_{2(g)} \longrightarrow 2NaCl_{(s)}$
   C. $Cl_{2(g)} + 2NaOH_{(aq)} \longrightarrow NaOCl_{(aq)} + NaCl_{(aq)} + H_2O(l)$
   D. $H_{2(g)} + Cl_{2(g)} \longrightarrow 2HCl_{(g)}$

10. Which of the following substance sublimes when heated
    A. Sodium carbonate B. Ammonium chloride
    C. Copper II chloride D. Potassium sulphate

11. The element that can be extracted from its oxide by chemical reduction using carbon is
    A. Sodium B. Aluminium

C. Iron D. Calcium

12. The atomic numbers of elements X, Y, W and Z are 9, 11, 16 and 12 respectively. Which one of the following pairs of element will form a covalent compound?

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

13. Which one of the following hydroxide is soluble in excess aqueous ammonia solution **but** insoluble in excess sodium hydroxide solution?

A. $Fe(OH)_2$ B. $Pb(OH)_2$
C. $Cu(OH)_2$ D. $Ca(OH)_2$

14. Which of the following processes is **not** used to remove permanent hardness in water

A. Addition of sodium carbonate B. Distillation
C. Ion exchange D. Boiling the water

15. An element A forms a covalent compound with oxygen of formula A_2O_3. Given that A belongs to period 3 of the Periodic Table, the electronic configuration of the atom of A is

A. 2 : 8 : 5 B. 2 : 8 : 7
C. 2 : 8 : 3 D. 2 : 8 : 6

16. Graphite is used as an electrode in electrolysis because it

A. has hexagonal layers B. has mobile electrons
C. is soft and slippery D. is black and translucent

17. Which of the following is strong acid

A. Citric acid B. Phosphoric acid
C. Carbonic acid D. Hydrochloric acid

18. $20cm^3$ of 0.1M sodium carbonate solution reacted completely with $10cm^3$ of dilute hydrochloric acid according to the equation below

$Na_2CO_{3(aq)} + 2HCl_{(aq)} \longrightarrow 2NaCl_{(aq)} + H_2O_{(l)} + CO_{2(g)}$

The molarity of the acid is

A. 0.1 M B. 0.4 M
C. 0.8 M D. 0.2 M

19. Which of the compounds below does not require catalyst in its manufacture

A. Sodium hydroxide B. Ammonia
C. Nitric acid D. Sulphuric acid

20. Which one of the following would dissolve in dilute hydrochloric acid?

A. Lead (II) sulphate B. Lead (II) chloride
C. Barium sulphite D. Barium sulphate

21. Nitrogen reacts with hydrogen according to the equation

$N_{2(g)} + 3H_{2(g)} \leftrightarrows 2NH_{3(g)}$

The total volume of gaseous products at the end of reaction formed when $120cm^3$ of hydrogen were mixed with $50cm^3$ of nitrogen is

A. $170cm^3$ B. $90cm^3$

C. $80cm^3$ D. $70cm^3$

22. Which one of the following gases can be used to oxidise Iron (II) ions to Iron (III) ions.

A. Sulphur dioxide B. Hydrogen sulphide

C. Chlorine D. Hydrogen chloride

23. The number of protons, neutrons, and electrons in an atom Z represented by $^{27}_{13}z$ respectively is

A. 13 14 13 B. 13 13 14

C. 14 13 13 D. 13 13 13

24. When 4.0 g of an oxide of the element X were reduced, 3.2g of Z were obtained. The simplest formula of the oxide of X is;

[X = 64 O =16]

A. XO B. X_2O

C. XO_2 D. X_2O_3

25. A solid M dissolves in water to form a colourless gas that fumes with hydrogen chloride gas. The solid M is likely to be

A. Na_3N B. Mg_3N_2

C. AlN D. K_3N

26. Vulcanisation of rubber is aimed at increasing its

A. strength and reactivity B. stability and viscosity

C. elasticity and reactivity D. strength and elasticity

27. Which one of the following conducts electricity in electrolytes?

A. Neutrons B. electrons

C. Protons D. Ions

28. Glucose burns in oxygen according to the equation below

$C_6H_{12}O_{6(s)} + 6O_{2(g)} \longrightarrow 6CO_{2(g)} + 6H_2O_{(l)}$; $\Delta H = -2802KJmol^{-1}$

The amount of heat produced when 18.0g of glucose is burnt completely in oxygen at the same temperature is

[H=1, C=12, O=16]

A. $\frac{2802}{18.0 \text{ X } 100}$ B. $\frac{180}{2802 \text{ X } 18.0}$

C. $\frac{180 \text{ X } 18.0}{2802}$ D. $\frac{2802 \text{ X } 18.0}{180}$

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

A. Sodium carbonate and Ammonium carbonate

B. Ammonium sulphate and Magnesium Sulphate
C. Barium carbonate and Barium nitrate
D. Zinc chloride and Zinc sulphate

30. The melting and boiling points of substances W, X, Y and Z are summarized below.

Substance	melting point (^oC)	Boiling point (^oC)
W	-135	-0.5
X	-38.9	356.6
Y	-145	-10
Z	-112	75.5

Which of the following pairs of substances are liquids at room temperature?

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

31. Which one of the following gases diffuses fastest under similar condition of temperature and pressure?

C=12, O =16, Cl =35.5, N =14, H =1

A. NH_3 B. CO
C. SO_4 D. Cl_2

32. …… is a process by which glucose is formed from starch.

A. Neutralization B. Polymerisation
C. Hydrolysis D. Fermentation

33. Which of the following hydrocarbons turns bromine water colourless?

A. Ethene B. Ethane
C. Butane D. Methane

34. Sodium nitrate decomposes according to the following equation.

$2NaNO_{3(s)} \longrightarrow 2NaNO_{2(s)} + O_{2(g)}$

The volume of oxygen at s.t.p produced when 10g of sodium nitrate are decomposed is,
(1 mole gas volume at s.t.p 22.4dm^3, Na=23, N=14, O=16)

A. $\frac{10 \text{ X } 22.4}{170}$ B. $\frac{10 \text{ X } 170}{22.4}$

C. $\frac{22.4 \text{ X } 10}{85}$ D. $\frac{10 \text{ X } 85}{22.4}$

35. During the extraction of sodium, the reaction that takes place at the anode is

A. $Na^+_{(aq)} + e \longrightarrow Na_{(s)}$
B. $NaCl_{(s)} \longrightarrow Na^+_{(aq)} + Cl^-_{(aq)}$
C. $2Cl^-_{(aq)} - e \longrightarrow Cl_{2(g)}$
D. $Na_{(l)} \longrightarrow Na^+_{(aq)} + e$

36. Which one of the following salts does NOT produce Ammonia gas when heated?

A. Ammonium carbonate B. Ammonium chloride

C. Ammonium sulphate D. Ammonium nitrate

37. Calcium carbonate reacts with hydrochloric acid according to the equation

$CaCO_{3(s)} + 2\,HCl_{(aq)} \longrightarrow CaCl_{2(aq)} + CO_{2(g)} + H_2O_{(l)}$

Which one of the following pairs of substances will show the highest rate of production of carbondioxide at room temperature.

A. $5cm^3$ *of 0.1 M HCl + 0.2 g of lumps of* $CaCO_3$

B. $5cm^3$ *of 0.2M HCl + 0.2g of powdered* $CaCO_3$

C. $5cm^3$ *of 0.1M HCl + 0.2g of powered* $CaCO_3$

D. $5cm^3$ *of 0.2M HCl + 0.2g of lumps of* $CaCO_3$

38. Which of the following is observed when solid lead(II) nitrate is heated strongly?

A. White residue when hot yellow when cold

B. A residue which is reddish brown when hot and yellow on cooling

C. A residue which is yellow when hot and white on cooling

D. A yellow residue when hot white when cold

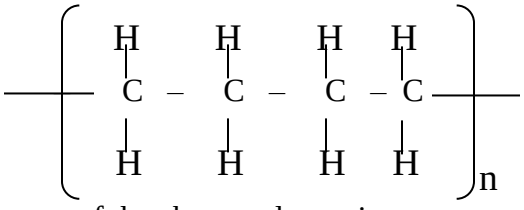
39. What mass of sodium hydroxide would be needed to neutralize exactly $200cm^3$ of 0.5M sulphuric acid ?

$2NaOH_{(aq)} + H_2SO_{4(aq)} \longrightarrow Na_2SO_{4(aq)} + 2\,H_2O_{(l)}$

(Na=23, O=16, H=1 and S = 32)

A. 4g B. 8g C. 16g D. 32g

40. The structure below is of a polymer.



The name of the monomer of the above polymer is

A. Ethene B. Ethane

C. Butane D. Butene

In each of the questions 41 to 45, one or more of the alternatives 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 1 and 3 only are correct

C. If 2 and 4 only are correct

D. If 4 only is correct

Instructions summarized

A	B	C	D
1, 2, 3 only are collect	**1,3 only are correct**	**2,4 only are correct**	**4 only is correct**

41. Which of the following element(s) reacts directly with oxygen to form an oxide?
    1. Magnesium
    2. Silver
    3. Copper
    4. Gold

42. During the purification of copper
    1. Impure copper is made the Anode
    2. Impure copper is made the cathode
    3. Pure copper is made the cathode
    4. Pure copper is made the Anode

43. The salts that can be prepared by precipitation is/ are
    1. Lead (II) nitrate
    2. Lead (II) sulphate
    3. Barium nitrate
    4. Barium sulphate

44. Which of the following contains the same number of particles as 2.4dm^3 of Argon at room temperature

    [Mg = 24, Ca = 40, C =12, O = 16, Al = 27, molar gas volume = 24dm^{3}at r.t.p]
    1. 2.4g of magnesium
    2. 4.0g of calcium
    3. 4.4g of carbon dioxide
    4. 3.4g of Aluminium

45. Carbon and phosphorous are similar in that both
    1. Are non – metallic elements
    2. Exist in allotropic forms
    3. Form covalent oxides
    4. Form neutral oxides

Each of questions 46 – 50 consist of an assertion (statement) on the left hand side and a reason on the right hand side.
Select:

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

Instruction summarized

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

46. Hydrogen gas can be collected by upward delivery	Because	it can easily explode when ignited in presence of delivery air	
47. The reactivity of alkali metals decreases down the group	Because	the atomic radius of the alkali increases down the group	
48. Hydrogen chloride gas can be used instead of ammonia gas in fountain experiment	Because	hydrogen chloride and ammonia are highly soluble in water	
49. Concentrated sulphuric acid is a strong oxidizing agent.	Because	it ionizes completely to produce H^+ in solution	
50. During electrolysis of dilute sulphuric acid, hydroxide ions are discharged in preference to sulphate ions at the anode	Because	sulphate ions carry a higher charge than hydroxide ion	

END