Name …… Sign ……

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(Do not write your school/centre name anywhere on this question paper)

545/1
CHEMISTRY
(theory)
July/August, 2022
1 ½ hours

KOBOKO DISTRICT SECONDARY SCHOOLS EXAMINATIONS BOARD

(KODSSEB)

Uganda Certificate of Education

Mock Examination 2022

CHEMISTRY

Paper 1

1Hour 30 minutes

INSTRUCTIONS TO CANDIDATES:

- *This paper consists of **50** multiple choice 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 questions answered in pencil will **NOT** be marked.*

FOR EXAMINER'S USE ONLY		
Question	Marks	Examiner Initial
Total		

Turn Over

1. The Valency of **M** in $M_2(SO_4)_3$ is
A. 2
B. 3
C. 4
D. 5

2. Which one of the following gases in the atmosphere makes rain water acidic?
A. Sulphurdioxide
B. Carbon monoxide
C. Ammonia
D. Nitrogen

3. The main components of biogas is
A. butane
B. ethane
C. ethane
D. nitrogen

4. Which one of the following mixture can be separated by sublimation?
A. Ammonium chloride and magnesium chloride
B. Sodium chloride and sodium carbonate
C. Calcium chloride and calcium carbonate
D. Lead (II) chloride and iron filings

5. Which one of the following processes is not an example of oxidations?
A. The burning of methane in air
B. The rusting of iron nails
C. The melting of a candles wax
D. The smoldering of phosphorus

6. Which one of the following reactions can be used to prepare hydrogen in the laboratory?
A. Reacting calcium with dilute sulphuric acid
B. Reacting sodium with water
C. Reacting zinc with dilute hydrochloric acid
D. Reacting magnesium with steam

Use the following information to answer questions 7 and 8.
The melting points and boiling points of substance R, S, T and U are shown below.

Substance	Melting point (℃)	Boiling point (℃)
R	17	118
S	-21	140
T	651	1100
U	-114	-8.5

7. Which one of the substances is a gas at room temperature (25℃)?
A. R
B. S
C. T
D. U

8. Which one of the substances is a metal?
A. R
B. S
C. T
D. U

9. 2.0g of sodium hydroxide was dissolved in water to make 500cm^3 of solution, the molarity of the solution is *(H = 1, O = 16, Na = 23)*
A. 2M.
B. 0.5M.
C. 0.1M.
D. 0.05M.

10. Which one of the following reactions shows the oxidizing property of Nitric acid?
A. $PbO_{(s)} + 2HNO_{3(aq)} \longrightarrow Pb(NO_3)_2 + H_2O_{(l)}$
B. $CaCO_{3(s)} + 2HNO_{3(aq)} \longrightarrow Ca(NO_3)_{2(aq)} + CO_{2(g)} + H_2O_{(l)}$
C. $Cu_{(s)} + 4HNO_{3(aq)} \longrightarrow NaNO_{3(aq)} + H2O_{(l)}$
D. $NaOH_{(aq)} + HNO_{3(aq)} \longrightarrow NaNO_{3(aq)} + H_2O_{(l)}$

11. Which one of the methods below is used to prepare a sample of copper (II) chloride?
A. Heating copper in a steam of dry chlorine
B. Action of copper on dilute hydrochloric acid.
C. Reacting copper (II oxide with hydrochloric acid
D. Heating copper in steam of dry hydrogen chloride

Turn Over

12. Sulphur dioxide behaves as an Oxidising agent when it reacts with
A. Concentrated nitric acid
B. Iron(III) sulphate
C. Hydrogen sulphide
D. Potassium dichromate

13. What is the percentage of sulphur in Iron(III) sulphate, $Fe_2(SO4)_3$?
(O = 16, S= 32, Fe = 56)

A. $\frac{32\ x\ 100}{4000}$.

B. $\frac{96\ x\ 100}{400}$.

C. $\frac{112\ x\ 100}{400}$.

D. $\frac{128\ x\ 100}{400}$.

14. Which one of the following crystalline substances will turn into white powder when exposed to air?
A. Cooper(II) sulphate.
B. Magnesium sulphate.
C. Sodium carbonate.
D. Calcium chloride.

15. Barium sulphate is insoluble in water. How can it be prepared in the laboratory?
A. By dissolving barium oxide in concentrated sulphuric acid
B. By adding barium nitrate solution to dilute sulphuric acid
C. By dissolving barium metal in dilute sulphuric acid
D. By adding barium carbonate to sulphuric acid

Use the following information to answer questions 16 and 17.
The electronic configuration of elements W, X, Y and Z are shown below.

W	2:8:3.
X	2:8:5.
Y	2:8:6.
Z	2:8:2.

16. Which of the following elements form positive ions?

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

17. Which one of the following pairs of elements will react to form a covalent compound?

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

18. When 4.0g of an oxide of an element X were reduced, 3.2g of X were obtained, the simplest formula of the oxide of X is (X = 64)

A. X_2O
B. XO
C. XO_2
D. X_2O_3

19. When silver nitrate was added to a solution followed by dilute nitric acid, a white precipitate was formed. The solution contained…….

A. Sulphate ions.
B. Carbonate ions.
C. Chloride ions.
D. Sulphite ions.

20. When aqueous ammonia was added to solution X, a white precipitate was formed, which dissolved in excess ammonia solution. X contained

A. Pb^{2+}.
B. Zn^{2+}.
C. Mg^{2+}.
D. Ca^{2+}.

21. Lead(II) nitrate reacts with potassium iodide according to the equation;

$Pb(NO_3)_{2(aq)} + 2KI_{(aq)} \longrightarrow PbI_{2(s)} + 2KNO_{3(aq)}$

The mass of lead(II) iodide that will be formed when 33.2g of potassium reacts with excess lead(II) is (K = 39, I = 127, Pb = 207)

A. 16.6g
B. 46.1g
C. 66.4g
D. 92.2g

Turn Over

22. Magnesium reacts with chorine when heated according to the equation;

$Mg_{(s)} + Cl_{2(g)} \longrightarrow MgCl_{2(s)}$

The volume of chlorine in litres at s.t.p that will react completely with 0.6g of magnesium is (I mole of gas at s.t.p occupies 22.4l, Mg = 24)

A. $\frac{0.6}{24}$ x 22.4.

B. $\frac{0.6}{24}$ x $\frac{22.4}{2}$.

C. $\frac{0.6}{22.4}$ x 24.

D. $\frac{0.6}{22.4}$ x $\frac{24}{2}$. [ ]

23. Which one of the following is the correct statement about electroplating a substance with copper?

A. The Anode is made of the substance to be copper plated
B. The cathode is made of copper
C. The Anode is made of copper
D. The electrolyte is dilute sulphuric acid [ ]

24. How is permanent hardness of water removed?

A. By boiling the water.
B. By adding stated soda lime.
C. By adding washing soda.
D. By adding ammonia solution. [ ]

25. Which one of the following equations represents a neutralization reaction?

A. $Fe_{(s)} + HCl_{(g)} \longrightarrow FeC_{l2(s)} + H_{2(g)}$
B. $NH_{3(g)} + H_{2(l)} \longrightarrow NH_4OH_{(aq)}$
C. $NaOH(aq) + HNO_{3(aq)} \longrightarrow NaNO_{3(aq)} + H_2O_{(l)}$
D. $2H_{2(g)} + O_{2(g)} \longrightarrow 2H_2O_{(l)}$ [ ]

26. The following are some properties of metals P, Q and R.

(i) P reacts only with steam to produce hydrogen
(ii) Q reacts with cold water to produce hydrogen
(iii) R displaces Q from solutions of its ions.

The order of reactivity of the metals beginning with the most reactive is;

A. P, Q, R
B. Q, R, P
C. P. R, Q
D. R, Q, P [ ]

27. When 2.0g of substance X were burnt, the heat produced raise the temperature of 1000g of water by 15.6℃.
The molar heat of combustion of x in joules is (the specific heat capacity of water is $4.2Jg^{-1}$ ℃, the relative mass of X is 60).

A. $\frac{1000\ x\ 4.2\ x\ 15.6\ x\ 60}{20}$

B. $\frac{15.6\ x\ 60\ x\ 1000}{2.0\ x\ 4.2}$

C. $\frac{15.6\ x\ 2.0\ x\ 1000}{4.2\ x\ 60}$

D. $\frac{4.2\ x\ 15.6\ x\ 60}{2.0\ x\ 1000}$

28. One disadvantage of hard water is that
A. it does not contain bacteria.
B. it forms lather more readily with soap.
C. it contains calcium compounds which help to form healthy bones.
D. it forms soluble boilers which prevents the boilers from leaking.

29. Which one of the following does not produce a white precipitate with lead(II) nitrate?
A. Dilute sulphuric acid.
B. Dilute hydrochloric acid.
C. Excess ammonia solution.
D. Excess sodium hydroxide solution.

30. Carbon monoxide can be obtained from Carbon dioxide by
A. heating Carbon dioxide in the absence of air.
B. passing Carbondioxide over heated carbon.
C. heating a mixture of Carbon dioxide and steam.
D. passing Carbon dioxide over heated copper.

31. Which one of the following solutions will neutralize $100cm^3$ of a 0.8M hydrochloric acid?
A. $10cm^3$ of a 0.08M sodium hydroxide.
B. $50cm^3$ of 0.4M sodium hydroxide.
C. $50cm^3$ of 0.8M sodium hydroxide.
D. $50cm^3$ of 1M sodium hydroxide.

Turn Over

32. Which one of the following is true about group VII elements?

A. They form ions of formula x^-.
B. They form ions of formula x^+.
C. They are colourless.
D. They exist as mono atomic molecules.

33. Methane burns in oxygen according to the following equation;

$CH_{4(g)} + 2O_{2(g)} \longrightarrow CO_{2(g)} + 2H_2O_{(l)}$

The volume of Carbondioxide formed when $20cm^3$ of methane is burnt in $40cm^3$ of oxygen is

A. $10cm^3$.
B. $20cm^3$.
C. $40cm^3$.
D. $60cm^3$.

34. Which one of the following substances will dissolve in water to give a solution that turns blue litmus red?

A. $(NH_4)_2SO_4$.
B. NaCl.
C. CH_3CH_2OH.
D. K_2CO_3.

35. Which one of the following is not a property of zinc oxide?

A. It is soluble in sodium hydroxide solution.
B. It is yellow when hot and white when cold.
C. It is soluble in water.
D. It is soluble in hydrochloric acid.

36. Potassium aluminum sulphate is used in the purification of water for

A. removing colouring matter.
B. killing harmful bacteria.
C. removing suspended matters.
D. softening water.

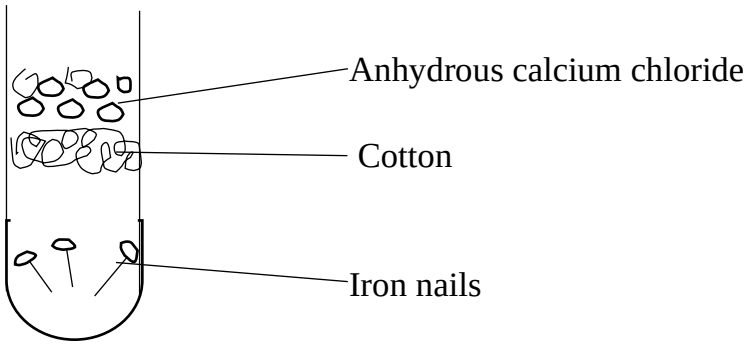
37. which one of the following catalyst is used in the manufacture of sulphuric acid by the contact process?

A. Vanadium(V) oxide.
B. Manganese(IV) oxide.
C. Platinized asbestos.
D. Finely divided iron.

38. Which one of the following processes is used to covert vegetable oil into fats?

A. Saponification.
B. Cracking.
C. Hydrogenation.
D. Polymerization.

39. The diagram below shows the setup of apparatus that was used to investigate the conditions under which rusting occurs.



The role of anhydrous calcium chloride is to absorb

A. Carbon dioxide from the air.
B. nitrogen from the air.
C. moisture from the air.
D. oxygen from the air.

40. During the extraction of sodium from sodium chloride ore calcium chloride is added to the ore before it is melted in order to:

A. removes impurities in the ore
B. catalyzes the reaction
C. lower the melting point of the ore
D. increase the solubility of sodium in the ore

Each of the questions 41 to 45 consists of an assertion (statement) on the left hand side and 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

Turn Over

INSTRUCTION SUMMARIZED

ASSERTION	REASON
A. True	True (Reason is a correct explanation).
B. True	True (Reason NOT a correct explanation)
C. True	Incorrect
D. Incorrect	Correct

41. Chorine is used in the purification of water BECAUSE chlorine is a beaching agent.

42. Hydrochloric acid react faster with zinc granuals than zinc powder BECAUSE zinc granuals have a smaller surface area than zinc powder.

43. Crude petroleum is refined by fractional distillation BECAUSE its fractions have different boiling points.

44. Zinc is used to galvanize iron BECAUSE zinc is passive in air

45. Pure sulphuric acid does not conduct electricity BECAUSE it has a great affinity for water.

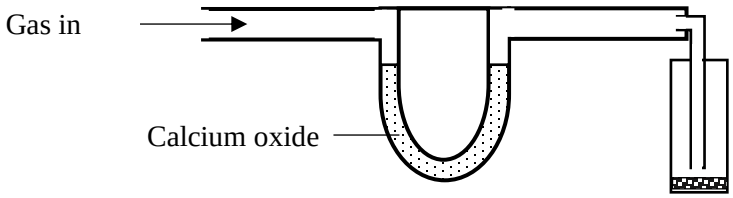
In each of the questions 46 to 50 one or more of the answers given may be correct. Read each question carefully and then indicate the correct answer A, B, C or D according to the following

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

46. Which of the following elements burn(s) in oxygen to form a basic oxide?

1. sodium
2. Sulphur
3. Calcium
4. Carbon

47.



Which of the following gases can be collected by the methods shown in the diagram?

1. H_2.
2. HCl.
3. O_2.
4. NH_3.

48. When a mixture of ethanol and concentrated sulphuric acid is heated, a gas is liberated. Which of the following properties is / are shown by gas?

1. Is insoluble in water
2. It decolourises bromine water
3. It discolourises potassium manganite VII
4. It forms a white precipitate with lime water

49. Which of the following occur(s) when sodium nitrate is strongly heated?

1. It melts.
2. It gains weight.
3. It liberates oxygen.
4. It liberates nitrogen dioxide.

50. In which of the following reactions is a catalyst required?

1. $S_{(s)} + O_{2(g)} \longrightarrow SO_{2(g)}$.
2. $2SO_{2(g)} + O_{2(g)} \longrightarrow 2SO_{3(g)}$.
3. $2NO_{(g)} + O_{2(g)} \longrightarrow 2NO2_{(g)}$.
4. $N2_{(g)} + 3H_{2(g)} \longrightarrow 2NH_{3(g)}$.

END