545/1
CHEMISTRY
Paper 1
TIME: 1 ½ Hours

BUIKWE DISTRICT JOINT MOCK EXAMINATIONS BOARD (BUSSHA)

MOCK EXAMINATIONS 2023

Uganda Certificate of Education

CHEMISTRY

Paper 1

INSTRUCTIONS TO CANDIDATES:

This paper consists of 50 objective-type questions.

*Attempt **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.*

*Do **not** use pencil.*

1. Solids are different from liquids in that they;
   A. Have definite shape
   B. Have definite size
   C. Have neither shape and size
   D. Have definite shape and size

2. A substance that melts sharply at a particular temperature is probably a
   A. Mixture
   B. Compound
   C. Pure substance
   D. Impure substance

3. A white precipitate Y was warmed and turned to a colorless solution and on cooling the white precipitate reappeared, Y is likely to be of;
   A. Lead (II) sulphate
   B. Barium chloride
   C. Lead (II) chloride
   D. Barium nitrate

4. The following oxides can be reduced by hydrogen gas EXCEPT
   A. Lead (II) oxide
   B. Sodium oxide
   C. Copper (II) oxide
   D. Mercury oxide

5. During the electrolysis of dilute sodium hydroxide solution, which of the following ions will be preferably discharged at the cathode?
   A. Sodium ion
   B. Chloride ion
   C. Hydrogen ion
   D. Hydrogen ion

6. An element Q forms a sulphate of formula $Q_2(SO_4)_2$. The Correct formula for its sulphide is

   A. QS

   B. Q_2S

   C. QS_2

   D. Q_2S_3

7. Carbon reacts with oxygen according to the equation below.

   $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)} AH = -393Kjmol^{-1}$

   What is the amount of heat in joules released when $5.8g$ of carbon completely burns in oxygen? $C = 12, O = 16$)

   A. 189,950

   B. 294,750

   C. 524,000

   D. 943,200

8. Chlorine gas was bubbled through water and the resultant solution exposed to sunlight such that a colorless gas was evolved. The colorless gas;

   A. burns with pop sound

   B. relights a glowing splint

   C. turns lime water milky

   D. forms misty fumes in air

9. The reaction of sodium peroxide with water yields oxygen gas and solution X. Which one of the following compounds which when reacted with X forms a gas that is less dense than air and turns damp red litmus paper blue?

   A. Ammonium chloride

   B. Sulphuric acid

   C. Manganese (IV) oxide

   D. Hydrochloric acid

10. Which one of the following solutions will form a white precipitate with soap even after boiling the solution?

A. Magnesium sulphate

B. Sodium hydrogen carbonate

C. Sodium sulphate

D. Calcium hydrogen carbonate

11. Which one of the following ions forms a hydroxide that is insoluble in excess ammonia solution?

A. Cu^{2+}

B. Zn^{2+}

C. Al^{3+}

D. Ca^{2+}

12. To a solution containing an anion, barium nitrate solution was added to form a white precipitate, the precipitate was filtered out to form a white residue which dissolved in dilute hydrochloric acid. The reaction leading to the formation of a white precipitate is;

A. $Ba^{2+}{}_{(aq)} + SO_4{}^{2-}{}_{(aq)} \rightarrow BaSO_{4(s)}$

B. $Ba^{2+}{}_{(aq)} + CO_3{}^{2-}{}_{(aq)} \rightarrow BaCO_{3(s)}$

C. $Ba^{2+}{}_{(aq)} + 2I^{-}{}_{(aq)} \rightarrow BaI_{2(s)}$

D. $Ba^{2+}{}_{(aq)} + 2Cl^{-}{}_{(aq)} \rightarrow BaCl_{2(s)}$

13. $8.2g$ of a crystalline solid $FeSO_4.nH_2O$ was strongly heated until no further change. The reduction in mass of the solid after heating was 3.72g.

The value of n *is* $(Fe = 56, S = 32, 0 = 16, H = 1)$

A. 10

B. 7

C. 6

D. 5

14. An element P reacts with a warm solution of iron (II) nitrate solution to form a colorless solution. The electronics configuration of P is likely to be

A. 2:8:2
B. 2:8:4
C. 2:8:6
D. 2:8:7

15. A mixture of sand, sodium chloride and potassium chloride was added to water, shaken and then filtered. The components in the filtrate can be separated by

A. Filtration
B. Sublimation
C. Fractional distillation
D. Fractional crystallization

16. Atom Q has atomic number 20 and mass number 40. Q loses two electrons to acquire a stable electronic structure. The number of protons, electrons and neutrons in the ion of Q is

	Protons	electrons	neutrons
A.	20	18	20
B.	20	20	20
C.	18	18	20
D.	18	20	20

17. Which one of the following reactions is an example of a precipitation reaction?

A. A reaction of bromine water with ethene
B. A reaction of chlorine with silver nitrate
C. A reaction of ammonia gas with sulphuric acid
D. A reaction of hydrochloric acid with sodium hydroxide

18. The following are properties of ethene EXCEPT

A. It undergoes polymerization to polythene

B. It changes bromine water from brown to colorless

C. Burns in excess oxygen forming carbon dioxide gas.

D. It undergoes substitution reaction with halogens

19. The following reactions require the use of a catalyst EXCEPT, the manufacture of

A. Sulphuric acid

B. Sodium carbonate

C. Ammonia

D. Nitric acid

20. 0.4moles of a hydroxide, $X(O)_2$ weighed 22.4g. which one of the following is the relative atomic mass of X?

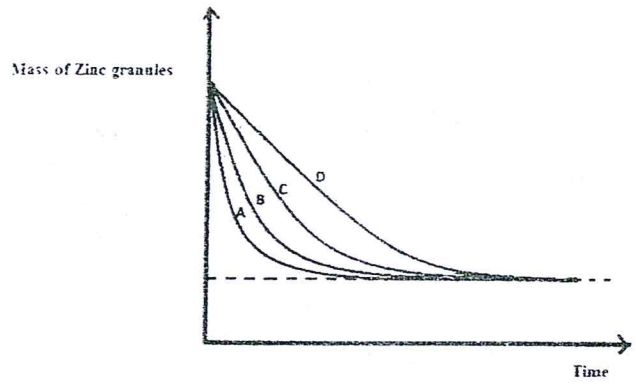
A. 24

B. 26

C. 48

D. 54

21. The graph below shows the temperature on the rate of reaction between Zinc granules of the same mass and excess $2M\ Hcl_{(aq)}$.



If curve B represents a reaction time carried out at 50°C, curve A represents a reaction carried out at

A. 20°C

B. 30°C

C. 40°C

D. 60°C

22. Calcium nitrate decomposes on heating according to the equation below.

$$2Ca(NO_3)_{2(s)} \rightarrow 2CaO_{(s)} + 4NO_{2(g)} + O_{2(g)}$$

The volume of oxygen gas formed at stp when $10g\ of\ ca(NO_3)_2$ is heated is $(Ca = 40, N = 14, O = 16, 1mole\ of\ gas\ of\ stp\ occupies\ 22.4dm^3)$.

A. $\frac{22.4\times10}{328}$

B. $\frac{10\times328}{22.4}$

C. $\frac{22.4\times10}{85}$

D. $\frac{10\times85}{22.4}$

23. Which one of the following cations would give a white precipitate when reacted with dilute sulphuric acid solution

A. Zn^{2+}

B. Al^{3+}

C. Cu^{2+}

D. Pb^{2+}

24. $20cm^3$ of hydrochloric acid completely reacted with $25cm^3$ of 0.05m sodium hydroxide solution. The molarity of the acid is

A. 0.0313

B. 0.0625

C. 0.1250

D. 0.250

25. The following affect the rate of reaction between two solid substances EXCEPT;

A. temperature

B. Concentration of substance

C. Surface area of reactants

D. Pressure

26. Which one of the following compounds is an alkyne?

A. C_2H_2

B. C_2H_6

C. C_2H_4

D. C_2H_5OH

27. Which one of the following elements reacts with chlorine to form a covalent compound?

A. Zinc

B. Magnesium

C. Copper

D. Hydrogen

28. When reacted with dilute ethanoic acid, a substance formed a salt and water only. The substance is likely to be.

A. An acidic oxide

B. An acidic salt

C. A metal

D. A basic oxide

29. Which one of the following forms a giant molecular structure?

A. Calcium silicate

B. Naphalein

C. Silicon tetrachloride

D. Sodium chloride

30. Carbondioxide gas can be most conveniently prepared in the laboratory by

A. Heating calcium carbonate

B. Reacting a dilute acid with a carbonate

C. Heating carbon in excess oxygen

D. Action of carbon monoxide with oxygen

31. Which one of the following gasses reacts with burning magnesium to form a white solid that dissolves in water to produce ammonia gas?

A. Carbon dioxide

B. Oxygen

C. Nitrogen

D. Sulphurdioxide

32. Which one of the following is NOT produced when an ammonium salt is heated with an alkali?

A. Ammonium chloride

B. Sodium chloride

C. Ammonia gas

D. Water vapor

33. Which one of the following sodium salts decomposes to give a colorless gas that forms a white precipitate with calcium hydroxide solution?

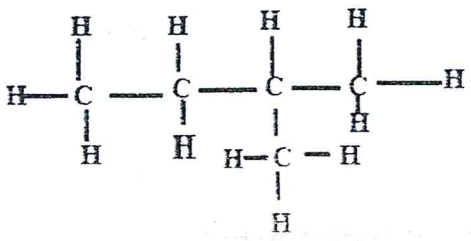
A. Na_2CO_3

B. $NaHCO_3$

C. Na_2SO_4

D. Na_2SO_3

34. An organic compound is represented by the structural formula below.



The name of the compound is

A. 3, methyl butane

B. 2, methyl butane

C. 3, ethyl butane

D. 2, ethyl butane

35. Phosphorous was made to react with air in a clean enclosed flask. The closed flask and its contents were weighed before and after the reaction. The flask was found

A. To have decreased in mass

B. Not to have changed in mass

C. To have increase in mass

D. To be full of nitrogen gas only.

36. Which one of the following when reacted together will give the highest temperature rise?

A. $100cm^3$ of 1M NaOH + $100cm^3$ 1M NH_4OH

B. $100cm^3$ of 1M NaOH + $100cm^3$ 1M HNO_3

C. $100cm^3$ of 1M NaOH + $100cm^3$ 1M CH_3COOH

D. $100cm^3$ of 1M NH_4OH + $100cm^3$ 1M CH_3COOH

37. Which one of the following has the highest percentages of nitrogen?

A. $(NH_4)_2SO_4$

B. $Ca(NO_3)_2$

C. $NaNO_3$

D. NH_4NO_3

38. Propane burns in oxygen according to the following equation;

$C_3H_{8(g)} + 5O_{2(g)}4H_2O(g) + 3CO_{2(g)}$

At acertain temperature and pressure, 10 liters of propane was completely burnt in oxygen. The volume of oxygen gas at s.t.p that is required to produce 150g of carbon dioxide is (H = 1,C = 12, O = 16, 1 mole of gas at s.t.p occupies 22.4 dm^3)

A. $(\frac{5 \times 150 \times 22.4}{3 \times 44})$

B. $(\frac{150 \times 22.4}{44 \times 6})$

C. $(\frac{44 \times 3}{5 \times 150 \times 22.4})$

D. $(\frac{44 \times 6}{150 \times 22.4})$

39. Which one of the following reagents is used to test for sulphur dioxide?

A. Concentrated nitric acid

B. Iron(III)sulphate

C. Hydrogen sulphate

D. Potassium dichromate

40. Which one of the following gases is / are absorbed when a mixture of carbon monoxide, ammonia and carbondioxide is bubbled through limewater ?

A. Carbonmonoxide

B. Carbondioxide

C. Carbonmonoxide and ammonia

D. Carbondioxide and ammonia

In each of the questions 41 to 45 one or more answers given may be correct. Read each question carefully and then indicate your answer according to the following

A. If 1,2,3 only arecorrect

B. If 1,3 only are correct

C. If 2,4 only are correct

D. If 4 only is correct

41. During electrolysis of dilute sulphuric acid using carbon electrodes;

1. Hydrogen gas is evolved at the cathode
2. Concentration of its ions increases
3. Oxygen gas is evolved at the anode.
4. Sulphate ions are discharged at the anode

42. When concentrated sulphuric acid is added to sugar in a beaker,

1. Carbon is formed
2. Sulphur oxide formed
3. Sugar is dehydrated
4. Sugar is oxidized

43. Hardness of water which can be removed by simple boiling is due to the presence of

1. Magnesium sulphate
2. Magnesium hydrogen carbonate
3. Calcium sulphate
4. Calcium hydrogen carbonate

44. An element in group 7 but below iodine is likely to be;

1. Colored
2. Diatomic
3. A solid at room temperature
4. A liquid at room temperature

45. In the manufacture of sulphuric acid by the contact process, its yield is increased by;

1. Increased pressure
2. Presence of vanadium (V) oxide
3. Using high temperature
4. Using excess oxygen

For questions 46 to 50, choose

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

B. If both assertion and reason are true statements and the reason is not a correct explanation of the assertion

C. If the assertion is true and reason is false

D. If the assertion is false and reason is a true statement

Instructions summarized

	Assertion	Reason
A. .	True	true (reason correct explanation)
B. .	True	true (Reason is not a correct explanation)
C. .	True	False
D. .	False	True

46. .	Copper reacts with concentrated nitric acid to produce nitrogen monoxide	Because	Copper is above hydrogen in the electro chemical series	
47.	Monoclinic sulphur is stable only at a temperature of above 96^0	Because	Its Atoms are arranged in a layer structure	
48.	Iron (II) chloride is prepared by direct synthesis	Because	Iron displaces hydrogen gas from dilute acids	

49.	Hydrogen chloride gas when bubbled in water liberates hydrogen gas with zinc grannules	Because	It forms hydrogen ions with water.	
50.	Dilute sulphuric acid is a strong dibasic acid.	Because	It fully ionizes in solution to form hydrogen ions.	

END