Candidates' Name: ……..……..……..

Signature: ……..…….....……

Random No.					Personal No.		

(Do not write your school / Center name or Number anywhere on this booklet)

545/1
CHEMISTRY
Paper 1
July/Aug. 2023
1½ hrs.

KAMTEC EXAMINATIONS BOARD

Uganda certificate of education
CHEMISTRY

Paper 1

1 hour 30 minutes

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* **boxes** *provided on the* **right – hand** *side of each question.*
Do **not** *use pencil.*
Mathematical tables, slide rules and silent non-programmable calculators may be used.

1 mole of a gas occupies 22.4dm^3 at stp.

For Examiner's use only	
Score	**Remarks**

Turn Over

1. Which one of the following contains the least amount of copper?

A. Blister copper.
B. Duralumin.
C. Brass.
D. Bronze.

2. Magnesium ion is formed from an atom with symbol $^{24}_{12}Mg$. What is the electronic configuration of the common ion formed by magnesium?

A. 2,8,8.
B. 2,8,3.
C. 2,8.
D. 2,8,4.

3. Margarine is manufactured from vegetable oil using nickel catalyst.
Which of the following is used to harden margarine?

A. Hydrogen.
B. Nitrogen.
C. Oxygen.
D. Neon.

4. when chlorine gas is bubbled through a solution of a potassium iodide, the solution formed contains

A. Iodine solution and potassium iodide solution.
B. Iodine solution and potassium chloride solution.
C. Chlorine water and potassium chloride solution.
D. Chlorine water and potassium iodide solution.

5. Sodium chloride is a liquid at 900°c. How are the particles arranged and how do they move in sodium chloride at 900°c.

	Arrangement of particles	Motion of particles
A	Regular	Vibrate about fixed point
B	Regular	Move randomly about fixed point
C	Random	Vibrate about fixed point
D	Random	Move randomly

6. Rock salt is a mixture of sand and sodium chloride. Sodium chloride is soluble in water but not hexane. Sand is insoluble in both water and hexane.
What is required to separate sand from sodium chloride.

1. filter paper.
2. fractionating column.
3. hexane.
4. water.

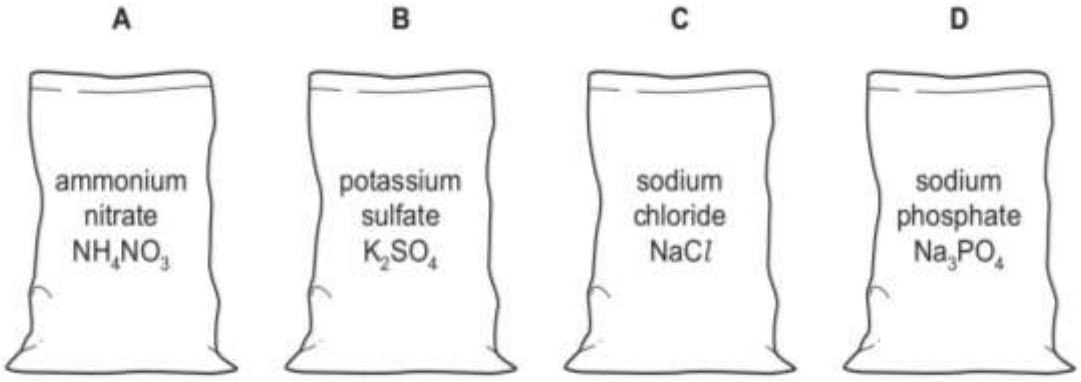
A. 1 and 3. B. 2 and 4. C. 2 and 4. 4. 1 and 4.

7. Diamond and graphite have giant covalent structures of carbon atoms. Which of the following statements is true about graphite only?
   A. It has a strong, rigid and three-dimensional structure.
   B. It has four strong covalent bonds between each carbon atom.
   C. It has layers which slide over each.
   D. It has no free electrons, so it doesn't conduct electricity.

8. The compound magnesium nitrate has a formula $Mg(NO_3)_2$. What is the relative molecular mass of magnesium nitrate. (Mg=24, N=14, O=16)
   A. 86. B. 134. C. 172. D. 148.

9. Which process is a physical change.
   A. Burning wood.
   B. Chopping vegetables.
   C. Cooking an egg.
   D. Rusting iron.

10. Which bag is not suitable to use as a fertilizer?



11. Carbon reacts with silver oxide to form carbon-dioxide and silver.
    Which substance is reduced?

A. Carbon.
B. Carbon dioxide.
C. Silver.
D. Sliver oxide.

12. The following are synthetic polymers except.
A. Polyethene.
B. Polyynyl chloride.
C. Starch.
D. Nylon.

13. Which of the following is the best method that can be used to distinguish between distilled water and sea water.
A. Using a litmus paper.
B. Carrying out a taste test.
C. Determining their melting point.
D. Using anhydrous copper (II) sulphate.

14. Three substances are listed below.
1. Copper.
2. Dilute sulphuric acid.
3. Solid lead (II) bromide.
Which substances conduct electricity?
A. 1, 2 and 3.
B. 1 and 2 only.
C. 1 and 3 only.
D. 2 and 3 only.

15. 12.7g of metal X reacts completely 11.3g of oxygen to form an oxide. What is the percentage composition of X in formular of oxide formed between X and O.
A. 71.68%.
B. 69%.
C. 52.9%.
D. 50.05%.

16. Which one of the following anions would form a white precipicipate with acidified barium nitrate solution?
A. Chloride ions.
B. Sulphate ions.
C. Sulphite ions.
D. Bromide ions.

17. What volume of a 0.25M sulphuric acid is required for complete neutralization of 25cm^3 of 0.5M potassium hydroxide solution?

A. 25cm^3. B. 12.5cm^3.

C. 30.1cm^3. D. 31.3cm^3.

18. Alkaline potassium permanganate is used to distinguish between the following classes of hydrocarbons except.

A. CH_4 and C_2H_6.

B. C_3H_6 and C_4H_{10}.

C. C_2H_4 and C_3H_6.

D. C_2H_4 and C_2H_6.

19. The following are raw materials for extraction of iron from Hematite except.

A. Hot compressed air.

B. Coke.

C. Coal.

D. Limestone.

20. which of the following nitrates when heated decompose to form only neutral gaseous products?

A. Ammonium nitrate.

B. Copper (II) nitrate.

C. Silver nitrate.

D. Potassium nitrate.

21. Ethanol burns in excess oxygen according to the following equation.

$C_2H_2OH_{(l)} + 3O_{2(g)} \longrightarrow 2CO_2 + 3H_2O_{(l)}$ + heat.

15.07g ethanol were completely burnt, 466.50KJ of heat was liberated. What is the amount heat liberated when 46g of ethanol were completely burnt in oxygen.

A. $\frac{0.4665 \text{ X } 15.05}{46}$ B. $\frac{46}{0.4665 \text{ X } 15.05}$

C. $\frac{0.4665 \text{ X } 46}{15.07}$ D. $\frac{0.4665 \text{ X } 15.07}{46}$

22. The mixture of aluminium oxide and copper (II) oxide was warmed with dilute nitric acid, to the resultant solution was added ammonia solution drop wise until excess and then filtered. What is the color of the residue and filtrate respectively?

A. Blue residue and colorless filtrate.
B. White residue and deep blue filtrate.
C. Blue residue and deep blue filtrate.
D. White residue and colorless filtrate.

23. 27.2g of an acid salt; $XHSO_4$ in $500cm^3$ reacted completely with $25cm^3$ 0f 0.2M of a metal hydroxide YOH. What is the value of X in the acid salt? ($12.5cm^3$ of the solution containing acid salt was required for complete neutralization, O=16, H=1, S=32)

A. 39.
B. 24.
C. 55.
D. 23.

24. The following oxides are black except.

A. CuO.
B. Fe_2O_3.
C. Fe_3O_4.
D. FeO.

25. The ease with which calcium, iron, magnesium, and zinc react with dilute sulphuric acid to produce hydrogen gas decreases in the order;

A. Mg > Ca > Fe > Zn.
B. Ca > Zn > Fe > Mg.
C. Fe > Zn > Mg > Ca.
D. Ca > Mg > Zn > Fe.

26. Sodium reacts with excess oxygen to form sodium peroxide according to the following equation.

$$2Na_{(s)} + O_{2(g)} \longrightarrow Na_2O_{2(s)}$$

Calculate the mass of sodium peroxide formed when 0.25g of sodium metal is completely reacted with oxygen. (Na=23, O=16)

A. $\frac{78 \text{ X } 0.25}{23 \text{ X } 2}$
B. $\frac{23 \text{ X } 2}{78 \text{ X } 0.25}$

C. $\frac{78 \text{ X } 23 \text{ X } 2}{0.25}$

D. $\frac{0.25 \text{ X } 23 \text{ X } 2}{78}$

27. From sodium to aluminium,

A. Reactivity of the elements increases.

B. The size of the atoms of the elements decreases.

C. The size of atoms of the elements increases.

D. The size of the atoms of the elements remains the same.

28.The following are completely ionized in water except.

A. Carbonic acid.

B. Hydrochloric acid.

C. Nitric acid.

D. Sulphuric acid.

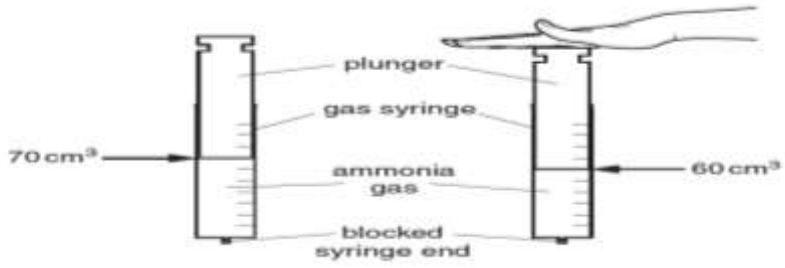
29. The concentration in moles per dm^3 of 0.0000526moles of calcium carbonate in $20cm^3$ of solution is

A. 0.001M. B. 0.0025M.

C. 0.32M. D. 0.00263M.

30. A gas syringe is filled with $70cm^3$ of ammonia gas. The pressure on the plunger is increased.

The temperature inside the syringe does not change while the volume decreases to 60 cm^3



The volume inside the syringe decreases because:

A. The ammonia molecules in gas syringe are closely packed and have strong intermolecular forces of attraction.

B. The ammonia molecules are moderately packed and have moderately strong intermolecular forces of attraction.

C. The ammonia molecules are spacely packed and have very weak intermolecular forces of attraction.

D. None of the above.

31. During extraction, limestone is heated to form calcium oxide and carbon dioxide. The role of calcium oxide is to:

A. Reduce the ore molten iron.

B. React with red hot coke

C. React with silicon (IV) oxide to form calcium silicate

D. Calcium oxide doesn't take part during extraction of iron.

32. The reaction between excess lead (II) carbonate with 0.5M nitric acid can be increases by:

A. Adding a catalyst.

B. Using powdered lead (II) carbonate.

C. Using 0.1M nitric acid instead of 0.5M nitric acid.

D. Using 1M nitric acid instead of 0.5M nitric acid.

33. A compound x, consists of 92.31% carbon and 7. 69% hydrogen and has a molecular formular C_xH_y. To which class of homologous series does compound X belongs

A. Alkynes B. Alkanes

B. Alkenes C. Arenes

34. The following are applications of different allotropes of carbon except.

A. Manufacture of face masks.

B. manufacture of polyethene bags.

C. Manufacture of fuel

D. Manufacture of printers' ink.

35. What mass of ethane gas will occupy the same volume as 8g of methane at s.t.p. (I mole of a gas occupies 22.400dm^3 at s.t.p)

A. 30 X 11.2 B. 22.4 X 1000

C. $\frac{22.4 \times 1000}{30 \times 1000}$ D. $\frac{30 \times 11.2}{11.2 \times 22.4}$ D. $\frac{11.2 \times 30}{22.4}$

36. The following are oxidation reactions except.

A. The reaction between carbon monoxide and oxygen.

B. The reaction between concentrated sulphuric acid and copper powder.

C. The reaction between heated coke and excess oxygen.

D. The reaction between heated coke and iron (III) oxide.

37. Which one of the following salts is prepared by precipitation method.

A. Na_2CO_3. B. $(NH_4)_2CO_3$.

C. $FeCO_3$. D. K_2CO_3.

38. When strongly heated,4.5g zinc nitrate decomposes according to the following equation.

$2Zn(NO_3)_{2(S)} \longrightarrow 2ZnO_{(S)} \quad 4NO_{2(g)} + O_{2(g)}$

What is the total volume of gaseous products at r.t.p?

(Zn=65, N=14, O=16, I mole of a gas occupy 24000cm^3)

A. 3300cm^3. B. 1428.57cm^3.

C. 1326cm^3. D. 1300cm^3.

39. The first step during waste water treatment is:

A. Coagulation.

B. Screening.

C. Filtration.

D. Sedimentation.

40. Nitrogen reacts with hydrogen according to the following equation.

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

$45cm^3$ of nitrogen reacted with $51cm^3$ of hydrogen to form ammonia gas. What is the volume of the residual gas?

A. $62cm^3$. B. $22.5cm^3$.

C. $20cm^3$. D. $28cm^3$.

Each of the questions **41** to **45** consists an assertion (statement) on left hand side and a reason on 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 correct.

D. if the assertion is not correct but the reason is a correct statement.

INSTRUCTIONS SUMMURISED.

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. potassium explosively reacts with cold water to produce hydrogen gas because potassium is a metal

42. Chlorine gas is manufactured by reaction between heated manganese (IV) oxide and concentrated hydrochloric acid. because manganese (IV) oxide oxidizes chloride ions chlorine gas.

43. Sodium metal is extracted by because sodium is highly electro

reduction positive

44. Calcium chloride is efflorescent because calcium chloride absorbs water when exposed to fo rm a solution.

45. calcium hydroxide is used to adjust pH of acidic soils because it has a pH greater seven 7

In each of the questions ***46*** to ***50***, one or more 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 1 and 3 only are correct.

C. If 2 and 4 only are correct

D. If 4 only is correct.

46. The following are examples of thermos-softening plastics.

1. Bakelite.
2. Polyethene.
3. Rubber.
4. Polyvinyl chloride.

47. Amphoteric oxides include:

1. Calcium oxide.
2. Aluminium oxide.
3. Sulphur dioxide.
4. Lead (II) oxide.

48. The following sulphates don't dissolve in water.

1. Barium sulphate.
2. Calcium sulphate.

3. Lead sulphate.

4. Sodium sulphate.

49. The following compounds can be used in a laboratory to prepare of oxygen gas.

1. Sodium chlorate.

2. Sodium chloride.

3. Sodium peroxide.

4. Sodium sulphate.

50. When concentrated sulphuric acid is added to sucrose

1. sugar charcoal is formed.

2. heat is released.

3. the spongy carbon swells.

4. Sulphur dioxide is evolved.

END