

**CANDIDATES NAME:**.....

INDEX NUMBER							

**SIGNATURE:** .....

**545/1  
CHEMISTRY  
PAPER 1  
JUNE/JULY  
1 HOUR 30 MINUTES**

**MOCK EXAMINATIONS SET 1 2019**  
**Uganda Certificate of Education**

**CHEMISTRY  
PAPER 1**

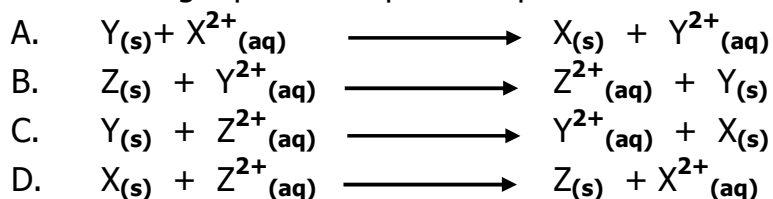
**1 HOUR 30 MINUTES**

**INSTRUCTIONS TO CANDIDATE:**

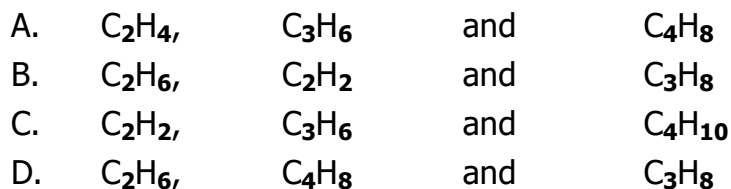
- ★ *This paper consists of 50 objective type questions.*
- ★ *Answer all questions.*
- ★ *You are required to write the correct answer A, B, C or D in the box provided on the right hand side of each question.*
- ★ *Do not use pencil.*

1. Which one of the following gases relights a glowing splint?  
A. hydrogen B. nitrogen  
C. dinitrogen oxide D. nitrogen monoxide ☐
2. Which of the following pairs of salts can be separated by filtration?  
A.  $\text{Na}_2\text{CO}_3$  and  $(\text{NH}_4)_2\text{CO}_3$  B.  $\text{Pb}(\text{NO}_3)_2$  and  $\text{PbCl}_2$   
C.  $\text{MgSO}_4$  and  $\text{MgCl}_2$  D.  $\text{ZnCO}_3$  and  $\text{CaSO}_4$  ☐
3. Which one of the following substances can alter the rate of chemical reaction between zinc and dilute hydrochloric acid.  
A. manganese (IV) oxide B. copper (II) sulphate  
C. vanadium (V) oxide D. iron (III) chloride ☐
4. Which one of the following oxides is soluble in both dilute nitric acid and concentrated sodium hydroxide solution?  
A.  $\text{Al}_2\text{O}_3$  B.  $\text{CuO}$  C.  $\text{SO}_2$  D.  $\text{Fe}_2\text{O}_3$  ☐
5. The atomic numbers of elements M, N, and T are 1, 8, 12 and 14 respectively. The element which can form ions by either losing or gaining electron(s) is:  
A. R B. T C. N D. M ☐
6. The molecular formula of  $5.6\text{dm}^3$  of an oxide containing 11.0g is (N = 14, O = 16, C = 12, S = 32, 1 mole of gas occupies  $22.4\text{dm}^3$ )  
A.  $\text{SO}_2$  B.  $\text{NO}_2$  C.  $\text{CO}_2$  D.  $\text{SO}_3$  ☐
7. The process by which physical properties of natural rubber are improved is:  
A. polymerisation B. vulcanisation  
C. saponification D. cracking ☐
8.  $20\text{cm}^3$  of a monobasic acid was neutralised by  $25\text{cm}^3$  of a 0.05m sodium carbonate. The molarity of the acid is?  
A.  $\frac{25 \times 0.05 \times 2}{2.0} \text{M}$  B.  $\frac{25 \times 0.05}{20} \text{M}$   
C.  $\frac{25 \times 0.05}{2 \times 20} \text{M}$  D.  $\frac{20 \times 0.05 \times 2}{25} \text{M}$  ☐
9. Which one of the following carbonates when heated decomposes without leaving a solid residue?  
A. magnesium carbonate B. copper (II) carbonate  
C. lead (IV) carbonate D. ammonium carbonate ☐

10. The order of reactivity of the elements X, Y and Z is  $Z > X > Y$ . Which one of the following equations represents possible reaction?


☐

11. Which one of the following sets of compounds belong to the same homologous series?


☐

12. The structure of an atom of element M is  $^{27}_{13}M$ . Which one of the following is the number of electrons in the outer most energy level of the particle  $M^{3+}$ ?


☐

13. Which of the following compounds in water does not contain ions?


☐

14. 5g of an organic compound  $C_2H_6O$  when burnt raised the temperature of 500g of water from  $15^{\circ}C$  to  $90^{\circ}C$ . The molar heat of combustion of the compound is: (C = 12, H = 1, O = 16, specific heat capacity of water is  $4.18Jg^{-1}C^{-1}$ )


☐

15. The percentage of Aluminium in hydrated Aluminium sulphate  $Al_2(SO_4)_3 \cdot nH_2O$  is 8.1%. The value of n in the hydrated compound is (H = 1, O = 16, Al = 27, S = 32)


☐

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


☐

17. Which one of the following is an example of unsaturated hydrocarbon?


☐

18. concentrated sulphuric was added to a solid Z, and white fumes of gas were produced. The anion in solid Z is:

A.	sulphate ion	B.	chloride ion	
C.	carbonate ion	D.	nitrate ion	<input type="text"/>

19. Which one of the following ion is discharged at the cathode when brine is electrolyzed using mercury cathode?

A.	sodium	B.	hydrogen	C.	hydroxide	D.	Chloride	<input type="text"/>
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20. Ammonia reacts with copper (II) oxide according to the following equation.  

$$2\text{NH}_3(\text{g}) + 3\text{CuO}(\text{s}) \rightarrow 3\text{H}_2\text{O}(\text{l}) + \text{N}_2(\text{g}) + 3\text{Cu}(\text{s})$$
The volume of ammonia at s.t.p that will react with 6.0g of copper (II) oxide is (H = 1, N 14, O = 16, Cu = 64, one mole of gas occupies  $22.4\text{dm}^3$  at s.t.p)

A.	$3.36\text{dm}^3$	B.	$2.52\text{dm}^3$	C.	$1.68\text{dm}^3$	D.	$1.12\text{dm}^3$	<input type="text"/>
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21. The suitable method of preparing anhydrous iron (II) chloride is by;

A.	passing dry chlorine over heated iron.	
B.	reacting iron (II) oxide with dilute hydrochloric acid	<input type="text"/>
C.	passing dry hydrogen chloride gas over heated iron	
D.	reacting iron with dilute hydrochloric acid	

22. Which one of the following metals will not react with dilute acid?

A.	copper	B.	calcium	C.	magnesium	D.	iron	<input type="text"/>
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23. Which one of the following cations forms a white precipitate insoluble in excess ammonia but shows no observable change when dilute sulphuric acid is added to it?

A.	$\text{Zn}^{2+}$	B.	$\text{Pb}^{2+}$	C.	$\text{Ca}^{2+}$	D.	$\text{Al}^{3+}$	<input type="text"/>
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24. The volume of 0.2M hydrochloric acid that will completely neutralise  $23\text{cm}^3$  of 0.25M sodium hydroxide is:

A.	$\frac{23 \times 0.25}{0.2}$	B.	$\frac{23 \times 0.2}{25}$	C.	$\frac{25 \times 0.2}{23}$	D.	$\frac{25 \times 23}{0.2}$	<input type="text"/>
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25. The product formed when excess sulphur dioxide is bubbled through sodium hydroxide solution is:

A.	sodium sulphite	B.	sodium sulphate	
C.	sodium hydrogen sulphite	D.	sodium hydrogen sulphate	<input type="text"/>

26. Which one of the following metals can be extracted by reduction process?

A.	sodium	B.	copper	C.	potassium	D.	calcium	<input type="text"/>
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27. The gas produced when dilute hydrochloric acid is added to iron(II) sulphide is:  
A. chlorine  
B. hydrogen  
C. hydrogen sulphide  
D. hydrogen chloride ☐
28. Which one of the following substances is not formed when copper (II) nitrate is heated strongly?  
A. O<sub>2</sub>  
B. CuO  
C. NO<sub>2</sub>  
D. NO ☐
29. 0.19g of metal Y reacted with dilute hydrochloric acid forming ion Y<sup>2+</sup> and evolving 180cm<sup>3</sup> of hydrogen gas at s.t.p. The relative atomic mass of Y is:  
(Molar gas volume at s.t.p is 22.4dm<sup>3</sup>)  
A. 23.5  
B. 42.2  
C. 11.8  
D. 30.2 ☐
30. Element Y has atomic number 14. The chemical bond in the hydride of Y is;  
A. ionic bond  
B. covalent bond  
C. dative bond  
D. metallic bond ☐
31. Which one of the following substances will conduct electricity in solid state?  
A. copper (II) sulphate  
B. sulphur  
C. copper  
D. silicon dioxide ☐
32. In which of the following reactions is sulphuric acid behaving as an oxidising agent?  
A. H<sub>2</sub>SO<sub>4</sub>(aq) + CuCO<sub>3</sub>(s) → CuSO<sub>4</sub>(aq) + H<sub>2</sub>O(l) + CO<sub>2</sub>(aq)  
B. H<sub>2</sub>SO<sub>4</sub> (aq) + CuO(s) → CuSO<sub>4</sub>(aq) + H<sub>2</sub>O(l)  
C. 2H<sub>2</sub>SO<sub>4</sub> (aq) + C(s) → 2SO<sub>2</sub>(g) + CO<sub>2</sub>(g) + 2H<sub>2</sub>O(l)  
D. H<sub>2</sub>SO<sub>4</sub>(aq) + Mg(OH)<sub>2</sub>(s) → MgSO<sub>4</sub>(aq) + H<sub>2</sub>O(l) ☐
33. 40cm<sup>3</sup> of carbon dioxide reacted with 40cm<sup>3</sup> of oxygen to carbon dioxide according to the equation below.  
$$2\text{CO}_{(\text{g})} + \text{O}_{2(\text{g})} \longrightarrow 2\text{CO}_{2(\text{g})}$$
  
The volume of the gas that was left unreacted is:  
A. 20cm<sup>3</sup>  
B. 40cm<sup>3</sup>  
C. 80cm<sup>3</sup>  
D. 30cm<sup>3</sup> ☐
34. Sea water contains dissolved salts. When chlorine was bubbled through sea water a reddish brown solution was formed. The most likely dissolved salt present is?  
A. KI  
B. NaBr  
C. NaCl  
D. MgCl<sub>2</sub> ☐

35. Two gases  $X_2$  and  $Y_2$  react to form a gaseous compound  $XY_3$  according to the following equation.



The yield of  $XY_3$  can be increased by:

- A. increasing volume and lowering temperature  
B. decreasing volume and lowering temperature  
C. increasing temperature and decreasing volume  
D. increasing temperature and increasing volume

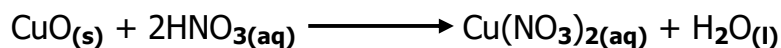
☐

36. Which one of the following substances is used in both preparation of oxygen and chlorine?

A.  $MnO_2$       B.  $KClO_3$       C.  $KMnO_4$       D.  $MnSO_4$

☐

37. 0.5g of impure copper (II) oxide reacted with 50cm<sup>3</sup> of 0.1m nitric acid according to equation below.



The percentage of the copper (II) oxide in the impure sample is  
(Cu = 64, O = 16, N = 14, H = 1)

A.  $\frac{80 \times 50 \times 0.1}{0.5}\%$

B.  $\frac{80 \times 50 \times 0.1}{20}\%$

☐

C.  $\frac{80 \times 50 \times 0.1}{10}\%$

D.  $\frac{50 \times 0.1 \times 10}{80}\%$

38. The residual gas produced when dry air is passed through concentrated sodium hydroxide and then over heated copper is:

- A. oxygen                                      B. carbon dioxide  
C. hydrogen                                    D. nitrogen

☐

39. Which one of the following will give a visible change when solution of sodium sulphate is added to it?

A.  $Mg^{2+}$       B.  $Ba^{2+}$       C.  $Zn^{2+}$       D.  $Al^{3+}$

☐

40. A compound P has molecular mass of 60 and contains 40% carbon, 6.71% hydrogen while the rest is oxygen. The molecular formula of P is?

A.  $CH_2O$       B.  $C_2H_4O$       C.  $C_2H_4O_2$       D.  $CH_4O_2$

☐

Each of the questions 40 to 45 consists of an assertion (statement) on the left hand side. Select;

- A. If both assertion and reason are true statements and the reason is a correct explanation for the assertion.
- B. If both assertion and reason are true statements but the reason is not a correct explanation for the assertion.
- C. If the assertion is true but the reason is not a correct statement.
- D. If the assertion is incorrect but the reason is a true statement.

### SUMMARY OF INSTRUCTIONS.

	ASSERTION	REASON
A	True	True (correct explanation)
B	True	True (Not correct explanation)
C	True	Not correct
D	Not correct	True statement

- |  |         |  |                          |
|--|---------|--|--------------------------|
| 40. Concentrated sulphuric acid is used as a drying agent  | because | Sulphuric acid has a high affinity for water                   | <input type="checkbox"/> |
| 41. Hydrochloric acid reacts faster with magnesium ribbon than magnesium powder  | because | Magnesium powder provides a greater surface area of contact    | <input type="checkbox"/> |
| 42. A mixture of ammonium chloride and sodium chloride can be separated by sublimation   | because | The salts have a common anion                                  | <input type="checkbox"/> |
| 43. Elements of group (I) of the periodic table are very electropositive   | because | Their valency electrons are strongly attracted by the nucleus. | <input type="checkbox"/> |
| 44. When copper (II) sulphate solution is electrolysed using copper electrodes, the intensity of the blue colour remains unchanged | because | No copper ions leave the solution as copper                    | <input type="checkbox"/> |
| 45. Galvanised iron does not rust  | because | Zinc forms a protective layer on the surface of iron           | <input type="checkbox"/> |

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 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. When copper powder is added to a solution zinc sulphate.

- |                                 |                            |
|---------------------------------|----------------------------|
| 1. a black solid is formed      | 2. A grey solid is formed  |
| 3. The solution fades in colour | 4. No reaction takes place |

☐

47. The following are the main sources of water pollution.

- |               |                   |
|---------------|-------------------|
| 1. Sewage     | 2. Photosynthesis |
| 3. Detergents | 4. Rain water     |

☐

48. The element X has atomic number 7. The element;

- 1. Has relative atomic mass 7
- 2. Is a non – metal
- 3. Has two electrons in the outermost shell
- 4. Reacts by gaining of electrons

☐

49. The observation (s) made when a burning magnesium ribbon is plugged into a jar of carbon dioxide is / are

- |                 |                   |
|-----------------|-------------------|
| 1. Bright light | 2. White ash      |
| 3. Black solid  | 4. Colourless gas |

☐

50. Which of the substances below contain the same number of moles as 224cm<sup>3</sup> of oxygen at s.t.p? (Molar gas volume at s.t.p = 22.4dm<sup>3</sup>)

- 1. 30cm<sup>3</sup> of 0.6m HCl
- 2. 2.4dm<sup>3</sup> of HCl<sub>(g)</sub> at room temperature
- 3. 3.64g of PbO (Pb = 207, O = 16)
- 4. 0.32 of oxygen gas

☐

**END**