

NAME: .....STREAM.....

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CHEMISTRY

PAPER 1

April, 2019

1½ hours

## BUZIGA ISLAMIC THEOLOGICAL INSTITUTE

Uganda Certificate of Education

END OF TERM ONE

S.3 CHEMISTRY

Paper 1

1 hour 30 minutes

### INSTRUCTIONS TO CANDIDATES:

*This paper consists of 50 objective type questions.*

*Attempt ALL the questions in this paper*

*You are required to write the correct answer A, B, C or D in the box provided in the right hand side of each question.*

*(H=1, C = 12, O = 16, Na= 23, Mg = 24, S = 32, Cl= 35.5, K = 39, Ca = 40, Fe =56,*

*Ag = 108, I= 127, 1mole of gas occupies 22.4dm<sup>3</sup> at S.T.P, 1 mole of a gas occupies 24dm<sup>3</sup> at Room Temperature)*

|                                |
|--------------------------------|
| <b>For Examiner's Use Only</b> |
|                                |
|                                |

**Answer all questions**

1. Brass is an alloy of

- A. Lead and Tin
- B. Iron and carbon
- C. Copper and zinc
- D. Magnesium and Aluminium

2. The atomic number of an element T is 16. Which one of the following is the nature of the oxide of T?

Acidic

- A. Acidic
- B. Neutral
- C. Basic
- D. Amphoteric

3. Which one of the following substances is formed when sodium is burnt in excess supply of air?

- A. Sodium oxide
- B. Sodium peroxide
- C. Sodium carbonate
- D. None

4. The cation that forms a green precipitate in sodium hydroxide solution is.....

- A.  $\text{Fe}^{2+}$
- B.  $\text{Cu}^{2+}$
- C.  $\text{Fe}^{3+}$

D.  $\text{Zn}^{2+}$ 

5. The full symbol of an atom of an element z is  ${}_{19}^{39}\text{Z}$ . Which one of the following is the number of neutrons in the nucleus of Z?

A. 19

B. 20

C. 39

D. 58

6. The atomic numbers of elements W, X, Y and Z are 9, 11, 12 and 14 respectively. Which one of the following pairs of elements can combine to form a covalent compound?

A. W and X

B. X and Y

C. Y and Z

D. Z and W

7. Which one of the following carbonates when heated decomposes without leaving a solid residue?

A. Ammonium carbonate

B. Copper(II) carbonate

C. Magnesium carbonate

D. Lead(II) carbonate

8. The relative formula mass of sodium carbonate decahydrate ( $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ ) is.....

A. 106

B. 286

C. 124

D. 142

9. Which one of the following is used in the laboratory preparation of carbon dioxide gas?

A. Iron

B. Calcium carbonate

C. Calicium carbonate

D. Calcium

10. When a piece of hot copper was lowered into a bell jar of air, the volume of air in the jar decreased. Which one of the following gases caused the decrease in the volume?

A. Water vapour

B. Carbon dioxide

C. Oxygen

D. Nitrogen

11. The number of particles in 12 grams of Magnesium ribbon is

(Mg = 12, Avogadro's number is  $6.02 \times 10^{23}$ )

A.  $\frac{12 \times 24}{6.02 \times 10^{23}}$

B.  $\frac{24 \times 6.02 \times 10^{23}}{12}$

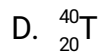
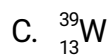
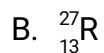
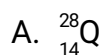
C.  $\frac{24 \times 6.02 \times 10^{23}}{24}$

D.  $\frac{1 \times 24 \times 6.02 \times 10^{23}}{12}$

12. The cation that gives a deep blue solution when aqueous ammonia is added is



13. The electronic configuration of an atom of element **G** is 2, 8, 2. Which one of the following elements will show properties similar to G?



14. Which of the following is a strong electrolyte?

A. Citric acid

B. Ethanoic acid

C. Calcium hydroxide solution

D. Sodium hydroxide solution

15. Which one of the following forms of carbon is used to absorb brown colour from crude sugar?

A. Wood charcoal

B. Sugar charcoal

C. Animal charcoal

D. Lamp black.

16. Which of the following metals can react with steam?

- A. Copper
- B. Lead
- C. Silver
- D. Iron

17. Which of the following is a physical change?

- A. Heating Iodine
- B. Heating potassium nitrate
- C. Burning sulphur
- D. Rusting of iron

18. Which one of the following drying agents can be used in a U-tube?

- A. Concentrated sulphuric acid
- B. Anhydrous calcium chloride
- C. Silicon dioxide
- D. Silica gel.

19. Which one of the following is **not** a property of a base?

- A. All bases react with acids to form salt and water.
- B. Solutions of all bases turn a red litmus paper blue
- C. All bases liberate ammonia from ammonium salts
- D. Some bases are not soluble in water.

20. Which of the following sulphates is prepared by precipitation method?

- A. Iron(II) sulphate
- B. copper(II) sulphate

- C. barium sulphate
- D. zinc sulphate

21. The mass of  $2 \times 10^{23}$  atoms of Aluminium is .....

(The atomic mass of Al = 27, Avogadro's number is  $6.02 \times 10^{23}$ )

- A.  $(2 \times 10^{23} \times 27)g$
- B.  $\frac{2 \times 1023 \times 27}{6 \times 1023}g$
- C.  $\frac{2 \times 1023 \times 27}{6 \times 1023}g$
- D.  $(2 \times 10^{23} \times 6.02 \times 10^{23} \times 27)g$

22. The chemical name of rust is.....

- A. Iron(III) oxide
- B. Hydrated iron(II) oxide
- C. Anhydrous iron(III) oxide
- D. Hydrated iron(III) oxide

23. Which one of the following substances if present in water can cause hardness that can be removed by boiling?

- A.  $CaSO_4$
- B.  $Na_2CO_3$
- C.  $Ca(HCO_3)_2$
- D.  $MgSO_4$

24. Anhydrous copper(II) sulphate can be used to test for water because it.....

- A. Is soluble in water
- B. Forms a coloured hydrate
- C. Is hygroscopic
- D. Is a coloured compound

25. Which one of the following is used to test for presence of carbon dioxide?

- A. Calcium chloride solution
- B. Calcium hydroxide solution
- C. Magnesium oxide
- D. Concentrated sulphuric acid

26. Which one of the following is not an allotrope of carbon?

- A. Diamond
- B. Graphite
- C. Amorphous
- D. Monoclinic

27. Graphite conducts electricity because

- A. It contains localized electrons
- B. It consists of 2 layers
- C. It has van der Waals forces
- D. It has delocalized electrons

28. The term mole is used in chemistry to mean

- A. Very many particles
- B. A specific number of atoms, molecules or ions in the substance.
- C. Amount of substance dissolved in  $1000\text{cm}^3$  of a solution
- D.  $6.02 \times 10^{23}$  particles of a substance.

29. Matter is made up of tiny particles that move in a continuous random motion. Which of the following theories explains the statement?

- A. Kinetic theory



- B. Brownian theory  
C. Avogadro's theory  
D. Gas theory

30. An organic compound contains 3.6g of carbon, 0.8g of hydrogen and 1.6 g of oxygen.

The relative molecular mass of the compound is 60. Its molecular formula is

(C=12, O=16, H=1)

A. CHO

C. C<sub>3</sub>H<sub>8</sub>O

B. C<sub>2</sub>H<sub>5</sub>O

D. C<sub>4</sub>H<sub>10</sub>O

31. Permanent hardness may be removed from water by the addition of large quantities of

A: Ca(HCO<sub>3</sub>)<sub>2</sub>

B: Ca(OH)<sub>2</sub>

C: K<sub>2</sub>CO<sub>3</sub>

D: CaCO<sub>3</sub>

32. The atomic numbers of elements Q, R, T and W are 2, 15, 19, and 20 respectively.

Which one of the elements shows similar properties as an element with atomic number 10?

A: Q

B: R

C: T

D: W

33. Which one of the following represents the reaction at the anode during electrolysis of copper (II) sulphate using copper electrodes?

A:  $4\text{OH}^-_{(\text{aq})} \longrightarrow 2\text{H}_2\text{O}_{(\text{l})} + \text{O}_2_{(\text{g})} + 4\text{e}^-$

B:  $\text{Cu}_{(\text{s})} \longrightarrow \text{Cu}^{2+}_{(\text{aq})} + 2\text{e}^-$

C:  $\text{Cu}^{2+}_{(\text{aq})} + 2\text{e}^- \longrightarrow \text{Cu}_{(\text{s})}$

D:  $2\text{H}^+_{(\text{aq})} + 2\text{e}^- \longrightarrow \text{H}_2_{(\text{g})}$

34. Which one of the following salts can be prepared by action of dilute acid on a metal?

A:  $\text{PbCl}_2$

B:  $\text{CuSO}_4$

C:  $\text{ZnSO}_4$

D:  $\text{AgCl}$

35. The main forms of carbon are diamond and graphite. Graphite conducts electricity but

Diamond does not. This is because:

A. Graphite is less dense than diamond.

B. there are no covalent bonds in graphite.

C. there are mobile electrons in graphite.

D. Graphite can be melted but not diamond.

36. Which statement about conduction of electricity is correct?

A. Electricity is conducted in aqueous solution by electrons.

B. Electricity is conducted in a metal wire by ions.

C. Electricity is conducted in a molten electrolyte by electrons.

D. Electricity is conducted in an acid solution by ions.

37. Which one of these salts is least soluble in water?

A.  $\text{CaCl}_2$

B.  $\text{CaCO}_3$

C.  $\text{Ca}(\text{NO}_3)_2$

D.  $\text{CaSO}_4$

38. Which one of the following oxides is a mixed oxide?

A.  $\text{Al}_2\text{O}_3$

- B. ZnO
- C. Fe<sub>3</sub>O<sub>4</sub>
- D. Na<sub>2</sub>O.

39. Which one of the following apparatuses does not measure a fixed volume?

- A. Pipette.
- B. Volumetric flask.
- C. Burette.
- D. Round bottomed flask.

40. Which one of the following gases reduces copper(II) oxide to copper?

- A. CO<sub>2</sub>
- B. CO
- C. NO<sub>2</sub>
- D. NO.

In each of the questions 41 to 45, 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 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

41. Which of the following is/are true about an element with atomic mass 19? It

- 1. Forms ionic oxides
- 2. Belongs to group II of the periodic table
- 3. Forms ionic chlorides
- 4. Shows a valency of 2.

42. The following elements have variable valency except.

- 1. Copper
- 2. Zinc

3. Iron

4. Aluminium

43. Iron is prevented from rusting by;

1. Electroplating

3. Sacrificial protection

2. Painting

4. Precipitation

44. Which of the following compounds are responsible for causing fur in kettles used in for boiling water?

1. Calcium sulphate

2. Calcium carbonate

3. Magnesium sulphate

4. Magnesium carbonate

45. Which of the following substances reacts with heated lead(II) oxide?

1. Hydrogen

3. Carbon

2. Copper metal

4. Oxygen

Each of the questions 46 to 50 consists of **an assertion** (statement) on the left hand side and a **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

| Instructions 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. Graphite and amorphous Carbon are allotropes of Carbon **BECAUSE** They are both black
47. During electrolysis, cations move to cathode And anions move to anode **BECAUSE** Like charges attract and unlike charges repel
48. Permanent hardness of water is caused by presence of  $\text{CaSO}_4$  and  $\text{MgSO}_4$  **BECAUSE** It cannot be removed by boiling
49. Water and ethanol can be separated by fractional distillation **BECAUSE** They have different boiling points
50. Sodium, potassium and calcium are in the same group of the periodic table **BECAUSE** They are all metals