Marking guide

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545/1
CHEMISTRY
Paper 1
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1 ½ hours

UGANDA TEACHERS' EDUCATION CONSULT (UTEC)

Uganda Certificate of Education

CHEMISTRY

Paper 1

1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES:

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.*

Molar gas volume at s.t.p is 22.4 dm^3

*Do **not** use pencil.*

For Examiners' Use Only

SECTION A

1. Which of the following can be used to separate a mixture of paraffin and water?
   A. Thistle funnel
   B. Burette
   C. Dropping funnel
   D. Filter funnel

   B

2. Which one of the following metals reacts more vigorously with cold water?
   A. Magnesium
   B. Calcium
   C. Potassium
   D. Sodium

   C

3. Which one of the following particles is responsible for transmission of electric current in a graphite electrode?
   A. Electrons
   B. Atoms
   C. Protons
   D. Ions

   A

4. Which one of the following nitrates decomposes when heated to produce di-nitrogen oxide gas (N_2O)?
   A. Potassium nitrate
   B. Ammonium nitrate
   C. Zinc nitrate
   D. Silver nitrate

   B

5. 20 cm^3 of 0.3M sodium hydroxide solution was completely neutralised by 15 cm^3 of 0.13M solution of acid $\mathbf{H_nY}$. The value of $\cap$ is
   A. 1
   B. 2
   C. 3
   D. 4

   C

6. Which one of the following acids can oxidize iron(ii) ions to Iron(iii) ions
   A. Dilute sulphuric acid
   B. Dilute nitric acid
   C. Concentrated hydrochloric acid
   D. Concentrated nitric acid

   D

7. Which one of the following gases re-lights a glowing splint?
   A. Carbon dioxide
   B. Hydrogen gas
   C. Nitrogen
   D. Di-nitrogen oxide

D

8. Which one of the following contains the same number of moles as 5.0 g of potassium? (K=39, N=14, Ca=40, O=16 Cu=64)
   A. 3.6 g of nitrogen gas
   B. 2.05 g of oxygen gas
   C. 4.5 g of calcium
   D. 6.4 g of copper

A

9. Which one of the following hydrocarbons is an example of a saturated hydrocarbon?
   A. C_2H_4
   B. C_3H_6
   C. C_2H_6
   D. C_4H_8

C

10. Which one of the following is observed when potassium iodide is added to copper (ii) sulphate solution?
   A. White precipitate in a brown solution
   B. Brown precipitate
   C. Blue precipitate
   D. Yellow precipitate

A

11. The electronic configuration of an atom of an element **Z** is 2:8:1. Which one of the following is true about the oxide of Z? It..
   A. is solid at room temperature
   B. is a gas at room temperature
   C. is soluble in organic solvent
   D. is a covalent compound

A

12. Which one of the following alloys is formed by mixing Lead and Tin?
   A. Bronze
   B. Solder
   C. Steel
   D. Brass

B

13. $25cm^3$ of 0.1M sodium hydroxide solution reacted with $10cm^3$ of dilute sulpuric acid completely. The concentration in $moldm^{-3}$ of sulphuric acid is;

A. 0.125M
B. 0.500M
C. 0.250M
D. 1.000M

A

14. Which one of the following drying agents is **not** used to dry carbon dioxide gas?

A. Silca gel
B. Concentrated sulphuric acid
C. Anhydrous calcium chloride
D. Calcium oxide

D

15. Which one of the following solutions will have a **pH** above 7?

A. Sodium chloride
B. Ammonium chloride
C. Sodium hydroxide
D. Hydrochloric acid

C

16. Which one of the following metals will displace iron (ii) ions from its solution?

A. Zn
B. Cu
C. Ag
D. Pb

A

17. The moles of hydrogen ions in 10 g of phosphoric acid (H_3PO_4) is (*H=1, P=31, O=16*)

A. 0.102 moles
B. 0.306 moles
C. 0.034 moles
D. 0.204 moles

D

18. Which one of the following gases is used in hardening of oils?

A. Ethene
B. Nitrogen
C. Hydrogen gas
D. Propene

C

19. The volume of a 0.25M of a hydrochloric acid required to completely neutralize 25.0 cm^3 of a 0.1M sodium carbonate solution is given by;

A. $\frac{25.0 \times 0.1}{2 \times 0.25}$

B. $\frac{2 \times 25.0 \times 0.25}{0.1}$

C. $\frac{25.0 \times 0.1}{0.25}$

D. $\frac{2 \times 25.0 \times 0.1}{0.25}$

D

20. The type of bond formed when atom $\frac{23}{11}J$ and $\frac{37}{17}Y$ is

A. Ionic bond
B. Co-ordinate bond
C. Covalent
D. Metallic

A

21. Which one of the following solutions turns reddish-brown bromine water to colorless

A. Ethane
B. Propane
C. Propene
D. Methane

C

22. Which one of the following is the use of adding calcium chloride to sodium chloride during extraction of sodium?

A. Increasing the solubility of sodium chloride
B. Increasing the melting point of sodium chloride
C. Increasing the boiling point of sodium chloride
D. Lowering the melting point of sodium chloride

D

23. Which one of the following solutions react with lead(ii) nitrate solution to form a precipitate that dissolves when heated and re-precipitates on cooling?

A. Sodium nitrate
B. Sodium sulphate
C. Sodium carbonate
D. Sodium chloride

D

24. The rate of evolution of hydrogen gas during the reaction between zinc and hydrochloric acid can be increased by
A. Using zinc granules
B. Using dilute hydrochloric acid
C. Adding copper(ii) sulphate
D. Reducing the temperature of the reaction mixture

C

25. Which one of the following gases forms dense white fumes with ammonia gas
A. Chlorine
B. Sulphur dioxide
C. Oxygen
D. Hydrogen chloride

D

26. 0.1 mole of a compound $YHCO_3$ weighs 8.4 g. The formula mass of the oxide of Y is (O=16)
A. 62
B. 42
C. 39
D. 23

A

27. When carbon dioxide is bubbled into a solution of calcium hydroxide, a white precipitate is formed. The precipitate dissolves in excess carbon dioxide forming colorless solution. The white precipitate is
A. Calcium oxide
B. calcium hydrogen carbonate
C. Calcium carbonate
D. Calcium dicarbide

C

28. Element **Z** burns in nitrogen to form a white solid which dissolves in water to produce a colorless gas that forms dense white fumes with hydrogen chloride gas. Element **Z** is;
A. Calcium
B. Sodium
C. Iron
D. Aluminum

A

29. Which one of the following anions when in solution will react with acidified barium nitrate to form a white precipitate?
A. Chloride
B. Carbonate
C. Sulphate
D. Nitrate

C

30. The heat produced when 2 g of propanol (C_3H_7OH) was completely burnt raised the temperature of 100g of water by 24.5°C. The enthalpy of combustion of propanol in KJ mol^{-1}. (C = 12, H = 1, O = 16)

A. $\left(\frac{60x24.5x4.2x100}{2x1000}\right)$

A

B. $\left(\frac{4.2x24.5x2x100}{60x1000}\right)$

C. $\left(\frac{4.2x24.5x4.2x100}{2}\right)$

D. $\left(\frac{4.2x24.5x2x1000}{100}\right)$

31. Which one of the following statements is true about temporally hardness of water? it

A. Consist of dissolved calcium sulphate and magnesium sulphate
B. Is not softened by boiling
C. Is softened by boiling
D. Does not form scum with soap

C

32. Which one of the following reagents forms yellow precipitate with potassium iodide solution?

A. Barium nitrate solution
B. Lead (II) nitrate solution
C. Silver nitrate solution
D. Barium chloride solution

B

33. The formula of the compound formed between a metal **L** and a non-metal **M** is L_2M_3. Which one of the following is the ion formed by **L**?

A. L^{2+}
B. L^{2-}
C. L^{3+}
D. L^{3-}

C

34. An alkaline gas **Y** reacts with hydrogen chloride gas to form dense white fumes. Which one of the following chloride salts is used in laboratory preparation of gas **Y**?

A. NaCl
B. NH_4Cl
C. $CaCl_2$
D. KCl

B

35. The molarity of the solution made by dissolving 5g of anhydrous sodium carbonate (Na_2CO_3) in $100cm^3$ solution is (Na = 23, C= 12, O=16).

A. $\frac{5 \times 100}{106 \times 1000} M$

B. $\frac{5 \times 1000}{106 \times 100} M$

C. $\frac{106 \times 100}{5 \times 1000} M$

D. $\frac{106 \times 1000}{5 \times 100} M$

B

36. Sodium peroxide reacts with water to produce a colorless gas **J**, that re-lights a glowing splint. The most suitable method of collecting dry gas **J** is

D

A. Upward delivery
B. Down ward delivery
C. Over water
D. Using a gas syringe

37. Which one of the following is the molecular formula of the monomer used in formation of polyethene

A

A. C_2H_4
B. C_2H_2
C. C_2H_6
D. C_3H_6

38. An element **P** is immediately below iodine in group VII of the periodic table. Which one of the following properties is for element **P?**

C

A. Exists as a liquid at room temperature
B. Is colorless
C. Would be displaced from its salts by bromine
D. Forms covalent compounds with group I elements

39. A hydrocarbon compound **F,** consists of carbon and hydrogen atoms only in a mole ratio of 1:2 respectively. 6.0 g of **F** occupy 3200 cm^3 at s.t.p. The molecular formula of **F** is *(1 mole of a gas occupies 22400 cm^3 at s.t.p)*

B

A. C_2H_4
B. C_3H_6
C. C_4H_8
D. C_5H_{10}

40. Ethanol burns in air according to the following eqation

$C_2H_5OH\ (l) + 3O_2\ (g) \longrightarrow 2CO_2\ (g) + 3H_2O\ (l);\ \Delta H = -1367\ kJ\ mol^{-1}$

The heat produced by burning 3 g of ethanol is *(H=1, C=12, O=16)*

A. $\left(\frac{1367 \times 46}{3}\right) kJ$

B. $\left(\frac{3}{1367 \times 46}\right) kJ$

C. $\left(\frac{1367 \times 3}{46}\right) kJ$

D. $\left(\frac{1367}{3}\right) kJ$

C

Each of the questions 41 to 45 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 the 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.

INSTRUCTION SUMMARISED

Assertion	*Reason*
A. True	*True and is a correct explanation*
B. True	*True but is not a correct explanation*
C. True	*Incorrect*
D. Incorrect	*Correct*

41. Dry carbon dioxide gas turns dry blue litmus paper to red	*Because*	Carbon dioxide gas is acidic	D
42. A reaction between iron and copper(ii) sulphate produces a green solution and brown solid	*Because*	Iron metal is more reactive than copper	A
43. Concentrated sulphuric acid is used to dry gases	*Because*	it is a non-volatile acid	B
44. Electrolysis of dilute sulphuric acid between carbon electrodes produces oxygen gas at the anode	*Because*	hydroxide ion is lower than sulphate ion in electrochemical series	A
45. A solution of ammonium chloride has a pH of less than 7	*Because*	Ammonium chloride is formed between a weak alkali and a strong acid	A

In each of the questions 46 to 50, one or more of the alternative 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

Instructions summarized

A	B	C	D
1, 2, 3 are correct	1, 3 are correct	2, 4 are correct	4 only is correct

46. Which of the following oxide(s) can be reduced by carbon monoxide?
    1. Magnesium oxide
    2. Copper(ii) oxide
    3. Aluminium oxide
    4. Lead(ii) oxide

C

47. Which of the following sulphate(s) is soluble in water?
    1. Calcium sulphate
    2. Barium sulphate
    3. Lead(ii) sulphate
    4. Magnesium sulphate

D

48. Which of the following acids partially ionizes in water
    1. Ethanoic acid
    2. Sulphuric acid
    3. Carbonic acid
    4. Hydrochloric acid

B

49. Which of the following solutions will form a precipitate with silver nitrate solution?
    1. Sodium sulphate
    2. Sodium nitrate
    3. Sodium chloride
    4. Sodium carbonate

D

50. Which of the following compounds is used in preparation of oxygen gas
    1. H_2O_2
    2. $KClO_3$
    3. Na_2O_2
    4. Na_2O

A

END