545/1
UCE Chemistry
Paper 1
August, 2023
1 hour 30 minutes

UNNASE MOCK EXAMINATIONS

Name.....

UGANDA CERTIFICATE OF EDUCATION

CHEMISTRY
PAPER 1
1 HOUR 30 MINUTES

Instructions to candidates

- This paper consists of 50 0bjective type questions
- Answer all questions
- You are required to write the correct answer A, B, C or D in blue or black ink in the box provided on the right hand side of each question
- Do not use a pencil. Any question answered in pencil will not be marked

For examiners use only

1. Which one of the following is a property of solids.
   A. They do not have definite shapes.
   B. Their volume are not fixed
   C. Their particles are closely packed
   D. They have weak forces of attraction between particles

2. Element X, belongs to group VIII of the periodic table. Which of the following is one of the uses of element X;
   A. In refrigerating
   B. For filling electric bulbs
   C. In manufacture of steel
   D. In conversion of oil to magarine

3. When water was added to a sample of solid T, a white suspension was formed, which dissolved on warming. Which one of the following is T?
   A. Lead (ll) chloride
   B. Lead (ll) Carbonate
   C. Lead (ll) iodide
   D. Lead(ll) sulphate

4. Which of the following acids produces ethene with ethanol?
   A. Hydrochloric acid
   B. Sulphuric acid
   C. Ethanoic acid
   D. Nitric acid

5. Which of the following substances is used with ammonium chloride in the laboratory preparation of nitrogen?
   A. Sodium nitride
   B. Sodium nitrate
   C. Sodium nitrite
   D. Sodium sulphite

6. Which one of the following liquids allows current to flow through it butremains chemically unchanged?
   A. Molten copper
   B. Glucose solution
   C. Molten lead (ll) chloride
   D. Dilute sulphuric acid

7. The reaction that leads to formation of ethene from ethanol is called?
   A. Cracking
   B. Polymerisation
   C. Decomposition
   D. Dehydration

8. The solubilities of salts W, X, Y and Z at $20^0$are given below:-

Salt	W	X	Y	Z
Solubility at 20^0C g/100g of water	54.8	74.5	36.0	179.0

Which one of the salts crystallizes out fast when a mixture of the salt is
separated by fractional crystallization?

   A. W
   B. X
   C. Y
   D. Z

9. Which of the following is true about ethanoic acid? The acid .....
   A. Does not neutralize alkalis
   B. Has a low solubility in water
   C. Is monobasic
   D. Ionizes completely in solution

10. Which of the following elements burns in oxygen with a blue flame?
   A. Phosphorous
   B. Sulphur
   C. Sodium
   D. Magnesium

11. Which one of the following compounds dissolves in water to form a

solution that is acidic to litmus?

A. Ammonia
B. Ammonium Sulphate
C. Sodium carbonate
D. Calcium oxide

12. Which of the following is true about bakelite?

A. It is a monomer
B. It does not soften on heating
C. It is made from rubber
D. It can be remoulded

13. Ammonia reacts with lead(ll) oxide according to the following:-

$2\ NH_3(g) + 3PbO_{(s)} \longrightarrow 3Pb_{(s)} + N_{2\ (g)} + 3H_2O_{(\ c)}$

The volume of nitrogen measured at s.t.p produced when excess ammonia is
passed over 11.15g of heated lead (ll) oxide is?
(Pb = 207, 0 = 16, 1 mole of a gas occupies 22.4dm^3 at s.t.p)

A. $\frac{3\ x\ 223}{22.4\ x\ 11.15}$

B. $\frac{3\ x\ 22.4}{11.15\ x\ 223}$

C. $\frac{11.15\ x\ 223}{3\ x\ 22.4}$

D. $\frac{11.15\ x\ 22.4}{3\ x\ 223}$

14. Which one of the following is the electronic configuration of the ion in the compound of calcium chloride?

A. 2.8
B. 2: 8: 7
C. 2: 8: 8
D. 2: 8: 8: 2

15. 5.0g of anhydrous sodium carbonate were dissolved in water to make 500cm³of solution. The molarity of the solution is?
(Na = 23, C = 12, O = 16)

A. 0.05M
B. 0.10M
C. 0.12M
D. 0.20m

16. 20.0cm³ of a 0.15M of an acid X, needed 18.0cm³ of a 0.5M sodium hydroxide solution for a complete neutralization. Which one of the of the following is acid X?

A. HNO_3
B. H_2SO_4
C. H_3PO_4
D. CH_3COOH

17. The electronic configuration of elements R, Q, T and V are 2:8, 2:5, 2:6 and 2:8:8:1 respectively. Which of the following pairs of elements will combine to form a compound with a high melting point?

A. R and Q
B. Q and T
C. T and V
D. R and V

18. The percentage of oxygen in $Al_2(SO_4)_3.18H_2O$ is
(al = 27, O = 16, S = 32, H = 1)

A. $\frac{192}{666} x\ 100$

B. $\frac{210}{666} x\ 100$

C. $\frac{288}{666} x\ 100$

D. $\frac{480}{666} x\ 100$

19. Which one of the following elements burns in oxygen to produce a substance that dissolves in water to form a solution with a PH greater than 7?

A. Sodium
B. Sulphur
C. Carbon
D. Phosphorous

20. Which of the following statements below is true about the electrolysis of lead (ll)nitrate solution using platinum electrodes?

A. The resulting solution turns red litmus to blue
B. Grey solid is deposited at the cathode
C. Brown fumes are observed at anode
D. There is effervescence of a colourless gas at the cathode

21. Propane burns in oxygen according to the following equation

$C_3H_8\ (g) + 5O_{2(g)} \longrightarrow 3CO_{2(g)} + 4H_2O_{(l)}$

Which one of the following would be the volume of carbon dioxide formed
when1.5dm^3 of propane was burnt in 3.5dm^3 of oxygen

A. 0.5dm^3
B. 0:7dm^3
C. 2.1 dm^3
D. 4.5dm^3

22. The concentration of hydrogen ions in one litre of the solution of some acids were measured. Which one of the following contained the highest concentration of the hydrogen ions?

A. Fuming sulphuric acid
B. 1M sulphuric acid
C. 2M ethanoic acid
D. 2M carbonic acid

23. Water samples X and Y form scum with soap but on boiling only sample Y form scum. Which one of the following statements is true?

A. X contains sodium carbonate
B. Y contains calcium sulphate
C. Y contains magnesium hydrogen carbonate
D. X contains magnesium sulphate

24. Which one of the following would be the correct order of separating a mixture of ammonium chloride, sodium chloride and iron filings

A. Filtration then magnetic separation
B. Magnetic separation then sublimation
C. Filtration then crystallization
D. Sublimation then crystallization.

25. Which one of the following solution contains the highest number of hydroxide ions in one litre of a 1M solution?

A. KOH(aq)
B. $Ca(OH)_{2(aq)}$
C. $NH_4OH_{(aq)}$
D. $Al(OH)_{3(aq)}$

26. Buildings painted with lead paint darkened when exposed to hydrogen sulphide due to formation of

A. Lead(II) oxide
B. Lead (II) sulphate
C. Lead(II) carbonate
D. Lead(II) sulphide

27. Which of the following salts is prepared by precipitation and is insoluble in dilute nitric acid?

A. Iron (II) sulphide
B. Barium carbonate
C. Sodium sulphite
D. Lead(II) sulphate

28. Which one of the following carbonates when heated decomposes to form a reddishbrown residue which turns yellow on cooling

A. $ZnCO_3$
B. $FeCO_3$
C. $PbCO_3$
D. $CuCO_3$

29. Which of the following carbonates can not react to completion with dilute hydrochloric acid?

A. Lead(ll) carbonate
B. Copper(ll) carbonate
C. Zinc carbonate
D. Magnesium carbonate

30. Plastics cause land pollution because they?

A. Are synthetic polymers
B. Can not be broken down by heat
C. Can only be broken down by high pressure
D. Can not be decomposed by bacteria

31. Which of the following hydrocarbons is an alkyne

A. CH_4
B. C_3H_4
C. C_3H_8
D. C_6H_6

32. Which of the following oxides can be reduced by carbon monoxide?

A. Calcium Oxide
B. Magnesium Oxide
C. Iron(lll) oxide
D. Sodium oxide

33. Element X, has an electronic configuration of 2:8:8:2, which group and period of the periodic table does X belong.

A. Group (ll) and period 4
B. Group (Vlll) and period 4
C. Group (Vl) and period 2
D. Group (lV) and period 2

34. Which of the following pairs of solid mixturescan not be separated by sublimation?

A. Sodium chloride and iodine
B. Iron (ll) chloride and sand
C. Copper(ll) sulphate and sodium chloride
D. Sodium sulphate and aluminium sulphate

35. When sodium hydroxide solution was added until into a solution Q and the mixture warmed, a greed precipitate and alkaline gas were observed. Which of the following pairs of ions are in Q.

A. NH_4^+ and Cu^{2+}
B. NH_4^+ and Al^{3+}
C. NH_4^+ and Fe^{2+}
D. NH_4^+ and Fe^{3+}

36. Which of the following metals can displace all the others from their solutions Iron, Zinc, Aluminium and Potassium

A. Zinc
B. Potassium
C. Iron
D. Aluminium

37. Which of the following molecules is monoatomic?

A. Helium
B. Hydrogen
C. Oxygen
D. Chlorine

38. The reaction scheme below shows the process under which substance T passed to form polythene

$$T \xrightarrow{\text{Process 1}} \text{Ethene} \xrightarrow{\text{Process 2}} \text{Polythene}$$

Which one of the following is substance T, process 1 and process 2 respectively?

A. Glucose, dehydration, cracking
B. Ethane, cracking, dehydration
C. Ethanol, dehydration and polymerization
D. Ethyne, polymerization and dehydration

39. The electronic configuration of atoms P, Q, R and T are shown below

Atom	Electronic configuration
P	2:8:7
Q	2: 8: 6
R	2:7
T	2:8:7

Which one of the following atoms are isotopes?

A. P and R
B. Q and T
C. R and T
D. P and T

40. Which of the following chlorides is prepared by direct synthesis?

A. Silver chloride
B. Iron(ll) chloride
C. Magnesium chloride
D. Sodium carbonate.

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

(i) If both the assertion and reason are true statements and the reason is a correct explanation of the assertion.

(ii) If both the assertion and reason are statements but the reason is not a correct explanation of the assertion.

(iii) If the assertion is true but the reason is not a correct statement

(iv) If the assertion is not correct but the reasons is a correct statement

INSTRUCTIONS SUMMARISED

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

41	Zinc ions can be separated from Alkalilead(ll) ions using Ammonia solution	**Because**	Ammonia is a weak alkalis	
42	When dry blue litmus paper wasplaced in a gas jar of hydrogen chloride, there is no observablechange	**Because**	Hydrogen chloride gas consistsof molecules	
43	Elements in group VII of the periodic table are called halogens	**Because**	They are monovalent	
44	Sodium chloride is used during preparation of soap	**Because**	the salt enhances solidification of soap	
45	During electrolysis of copper(ll) Sulphate using copper electrodes The size of the cathode reduces	**Because**	the anode keeps on dissolving	

In each of the questions 46 to 50, one or more of the answers given may be correct. Read each question carefully and indicate the correct answer according to the following:-

(i) If 1, 2 and 3 only are correct
(ii) If 1 and 3 only are correct
(iii) If 2 and 4 only are correct
(iv) If 4 only is correct

46. Which of the following load salt dissolve (s) more in water with increased in temperature
    1. $PbSO_4$
    2. $PbCO_3$
    3. PbI_2
    4. $PbCl_2$

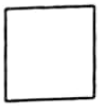
47. Which of the following elements is/are allotropic
    1. Aluminium
    2. Sulphur
    3. Sodium
    4. Carbon

48. Z was found to be an element in group V of the periodic table, Z is likely to form an oxide with the formula
    1. ZO_3
    2. Z_2O_3
    3. Z_2O
    4. Z_2O_5

49. Which of the following anions will form a precipitate with barium ions
    1. CO_3^{2-}
    2. SO_4^{2-}
    3. SO_4^{2-}
    4. Cl^-

50. The chloride(s) that will sublime when heated

1. $FeCl_3$
2. NH_4Cl
3. $AlCl_3$
4. $CaCl_2$



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