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545/1

CHEMISTRY

Paper 1

18 July 2014

1 ½ hours

ENTEBBE JOINT EXAMINATION BUREAU

Uganda Certificate of Education CHEMISTRY

PAPER 1

1 hour 30 minutes

INSTRUCTIONS TO  
CANDIDATES

This paper consists of 50 objective -  
questions. Attempt all questions.

You are required to write the correct answer A, B, C or D in the  
answer grid provided below.

Do not use pencil.

Molar gas volume at s.t.p =  $22.4 \text{ dm}^3$  or  $22,400 \text{ cm}^3$ .

Molar gas volume at room temperature =  $24.0 \text{ dm}^3$  or  $24000 \text{ cm}^3$ .

C = 12, H = 1, Cu = 63.5, S = 32, O = 16.

ANSWER GRID										
1	2	3	4	5	6	7	8	9	10	
11	12	13	14	15	16	17	18	19	20	
21	22	23	24	25	26	27	28	29	30	
31	32	33	34	35	36	37	38	39	40	
41	42	43	44	45	46	47	48	49	50	
								<b>TOTAL SCORE</b>		

1. Which of the following substances conducts electricity in solid state?

- A. Sulphur
- B. Graphite
- C. Phosphorous
- D. Iodine

The electronic configurations of elements W and X are 2: 8: 3 and 2: 6 respectively. The formula of the compound formed between W and X is

- A.  $W_3X_2$
- B.  $W_2X_3$
- C.  $W_2X$
- D.  $WX_3$

3. Which of the following nitrates does not produce oxygen when strongly heated?

- A.  $KNO_3$
- B.  $Ca(NO_3)_2$
- C.  $Cu(NO_3)_2$
- D.  $NH_4NO_3$

Calculate the number of moles of sodium hydroxide contained in 25.0 cm<sup>3</sup> of 0.2 M sodium hydroxide solution.

- A. 0.005 moles
- B. 0.02 moles
- C. 0.5 moles
- D. 0.25 moles

5. Concentrated Nitric acid was added to Iron (II) Sulphate solution. State what was observed.

- A. A brown ring
- B. A brown solution
- C. A green precipitate
- D. A green solution.

6. Which one of the following substances when heated does not undergo a permanent change?

- A. Iodine
- B. Copper (II) nitrate
- C. Zinc oxide
- D. Calcium

7. Which one of the following substances given below can burn in carbon dioxide?
- A. Aluminium
  - B. Magnesium
  - C. Zinc
  - D. Lead
8. Graphite conducts electricity because it
- A. Has hexagonal carbon rings
  - B. Is soft
  - C. Has mobile electrons
  - D. Is opaque
9. Which one of these is used to test oxygen in the laboratory?
- A. lime water
  - B. glowing splint
  - C. cobalt (II) chloride paper
  - D. burning splint
10. Element W has electronic structure 2: 8: 3. What is the formula of the ion of W?
- A.  $W^{3+}$
  - B.  $W^+$
  - C.  $W^{2+}$
  - D.  $W^2$
11. Chlorine atom has electronic configuration of 2: 8: 7. The electronic configuration of the chloride ion ( $Cl^-$ ) is
- A. 2: 8: 7
  - B. 2: 8: 6
  - C. 2: 8: 8
  - D. 2: 8: 5
12. Which one of the following acids will react with calcium carbonate to produce the least volume of carbon dioxide gas?
- A. Dilute Sulphuric acid
  - B. Dilute Hydrochloric acid
  - C. Dilute Nitric acid
  - D. Dilute Ethanoic acid

13. When 8g of salt was dissolved in 100g of water, the temperature decreased by 10°C. The drop in temperature when 2g of the salt is dissolved in 100g of water is
- A. 10°C B. 8.0°C C. 2.0°C D. 0.2°C
14. The full symbol of an atom is  ${}^{39}_{19}\text{Z}$ . The number of protons, electrons and neutrons in the ion formed by Z are.
- |    | <i>Electrons</i> | <i>Protons</i> | <i>Neutrons</i> |
|----|------------------|----------------|-----------------|
| A. | 19               | 19             | 20              |
| B. | 18               | 19             | 20              |
| C. | 19               | 18             | 20              |
| D. | 18               | 20             | 19              |
15. Which one of the following gases is produced when Zinc nitrate is heated strongly?
- A. Nitrogen  
B. Dinitrogen oxide  
C. Nitrogen monoxide  
D. Nitrogen dioxide
16. Which one of the following salts can be prepared by synthesis?
- A. Lead (II) Iodide  
B. Ammonium nitrate  
C. Sodium carbonate  
D. Iron (III) chloride
17. To which of the following groups and periods in the Periodic table does an element with atomic number 19 belong?
- A. Group II, Period 4  
B. Group I, Period 4  
C. Group IV, Period 2  
D. Group II, Period 2
18. Which one of the following is a property of carbon dioxide? It
- A. is less dense than air  
B. is neutral to litmus paper  
C. reacts with sulphuric acid  
D. reacts with burning magnesium

Turn Over

19. Which one of the following oxides will not react with water?
- A. Sulphur dioxide  
B. Nitrogen dioxide  
C. Calcium oxide  
D. Zinc oxide

20. 2.07g of a metal Z combined with oxygen to form 3.02g of oxide. Which one of the following is the formula of the oxide of Z? (O = 16, Z = 52)

- A. Z<sub>2</sub>O<sub>3</sub>
- B. Z<sub>3</sub>O<sub>2</sub>
- C. Z<sub>2</sub>O
- D. ZO<sub>2</sub>

21. Which one of the following cations, when in solution will not form a precipitate on reacting with sodium sulphate solution?

- A. Ca<sup>2+</sup>
- B. Pb<sup>2+</sup>
- C. Ba<sup>2+</sup>
- D. Zn<sup>2+</sup>

22. Which one of the following sodium salts will react with dilute hydrochloric acid to form a gas that turns potassium manganate (VII) colourless?

- A. Sodium chloride
- B. Sodium nitrate
- C. Sodium sulphite
- D. Sodium carbonate

23. Which of the following gases will not reduce Copper (II) oxide to copper?

- A. Hydrogen
- B. Carbon monoxide
- C. Carbon dioxide
- D. Ammonia

24. Which of the following is not a large scale use of chlorine?

- A. Electrolysis of sodium chloride
- B. Manufacture of bleaching powder
- C. Purification of drinking water
- D. Manufacture of plastics

25. The anion which can be formed by the brown ring test is

- A. Chloride
- B. Sulphate
- C. Nitrate
- D. Carbonate

26. Which one of the following pairs of the substances is used for the laboratory preparation of chlorine?

- A. Dilute hydrochloric acid and potassium manganate (VII)
- B. Concentrated sulphuric acid and sodium chloride
- C. Dilute hydrochloric acid and sodium sulphite
- D. Concentrated hydrochloric acid and potassium manganate (VII)

27. Butane undergoes combustion according to the following equation;

The mass of butane required to produce 950kJ of heat is  
( $H = 1$ ,  $C = 12$ , 1 mole of butane produces 2877KJ of heat.)

A.  $\left(\frac{950 \times 8}{2 \times 2877}\right)g$

B.  $\left(\frac{950 \times 58}{2877}\right)g$

C.  $\left(\frac{950 \times 58 \times 2}{2877}\right)g$

D.  $\left(\frac{2877 \times 58}{950}\right)g$

28. Which one of the following oxides when heated will react with carbon to form a brown solid?

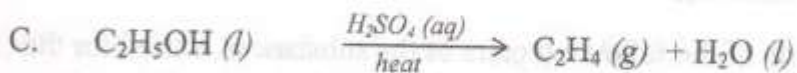
- A. CuO
- B. ZnO
- C. PbO
- D. FeO

29. Which of the following is not a property of carbon?

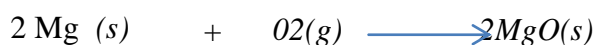
- A. It reduces conductivity.
- B. It reduces Iron (III) oxide
- C. It burns in air to form a basic oxide
- D. It shows allotropy

Turn Over

30. Which one of the following equations shows a reaction in which sulphuric acid is behaving as an oxidising agent?



31. Magnesium burns in air according to the equation:



The mass of oxygen required to burn 5g of magnesium completely is  
[ $O = 16$ ,  $Mg = 24$ ]

- A.  $\frac{5 \times 16 \text{ g}}{24}$
- B.  $\frac{5 \times 16 \text{ g}}{48}$
- C.  $\frac{5 \times 32 \text{ g}}{28}$
- D.  $\frac{5 \times 32 \text{ g}}{48}$

32. Which of the following compounds can undergo polymerization reaction?

- A. CH<sub>4</sub>
- B. C<sub>2</sub>H<sub>4</sub>
- C. C<sub>3</sub>H<sub>8</sub>
- D. C<sub>4</sub>H<sub>10</sub>

33. The volume of 0.01 NaOH solution that is required to react completely with 25.0 cm<sup>3</sup> of 0.02 M hydrochloric acid is

- A. 12.25cm<sup>3</sup>
- B. 25.0cm<sup>3</sup>
- C. 50cm<sup>3</sup>
- D. 75.0cm<sup>3</sup>

34. Ammonia reacts with copper (II) oxide according to the following equation.



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, 1 mole of gas occupies 22.4dm<sup>3</sup> at s.t.p)

- A. 3.36dm<sup>3</sup>
- B. 5.52dm<sup>3</sup>
- C. 1.68dm<sup>3</sup>
- D. 1.12dm<sup>3</sup>

35. Solution Y forms a white precipitate with silver nitrate solution. The precipitate is insoluble in nitric acid. Y is likely to contain

- A. Cl<sup>-</sup>
- B. SO<sub>4</sub><sup>2-</sup>
- C. NO<sub>3</sub><sup>-</sup>
- D. CO<sub>3</sub><sup>2-</sup>

36. Which one of the following is likely to be the pH of dilute Hydrochloric acid?

- A. 2
- B. 6
- C. 7
- D. 9

37. When 5.74g of a hydrated salt X was heated. 3.22g of the anhydrous salt Y was formed. The number of moles of water of crystallization in X is  
 [Y = 16J 0 - 16,H = 1]
- A. 2  
 B. 5  
 C. 7  
 D. 10

38. Which one of the following oxides is soluble in both dilute nitric acid and dilute sodium hydroxide solution?

- A. Copper (II) oxide B. Magnesium oxide  
 C. Calcium oxide  
 D. Zinc oxide

Turn Over

39. Potassium aluminium sulphate is used in the purification of water for

- A. removing colouring matter  
 B. killing harmful bacteria  
 C. removing suspended water  
 D. softening water

40. The mass of sodium hydroxide present in 200 cm of a 0.05M sodium hydroxide solution is [H = 1, O = 16, Na = 23]

- A. 0.25g B. 0.40g C. 2.00g D. 10.00g

Each of the questions 41 to 45 consists of an assertion on the left hand side and the reason on the right hand side.

- 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 correct statements but the reason is not a correct explanation of the assertion.  
 C. If the assertion is true but the reason is not a true statement.  
 D. If the assertion is not correct but the reason is a true statement.

INSTRUCTIONS SUMMERISED		
	Assertion	Reason
A	True	True (Reason is a correct explanation)
B	True	True (Reason is not a correct explanation)
C	True	Incorrect
D	Incorrect	True



41. Graphite and Diamond Show different Chemical properties **because** Graphite and Diamond are allotropes of carbon
42. Ethene changes colour of Bromine water from reddish - Brown to colourless **because** Ethene is a hydrocarbon
43. Ammonia is prepared by Reacting ammonium salt With calcium hydroxide **because** Calcium hydroxide is a base
44. When Sodium peroxide is dissolve in water, A gas is evolved. **because** Sodium peroxide reacts with water to form Hydrogen.
45. Concentrated sulphuric acid Can be used to Dry Ammonia. **because** sulphuric acid reacts with Ammonia

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

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

INSTRUCTIONS SUMMERISED			
A	B	C	D
1,2,3, Only correct	1,3 Only correct	2,4 Only correct	4 Only correct

46. Which of the following is/are true about electroplating of iron with silver?

1. Silver nitrate solution is used as electrolyte
2. Silver is made the anode.
3. Iron is made the cathode
4. Iron (II) sulphate solution is used as electrolyte

47. Which of the following usually causes water pollution?

1. Calcium hydrogen carbonate
2. Phosphate detergents
3. Magnesium sulphate
4. Sewage.

48. Which of the following statements is/are true about elements in Group (II) in the Period table?

1. Have similar chemical properties.
2. Have the same number of energy levels.
3. Their ions carry the same number of charge
4. Their reactivity increases as you go up the group

49. Which of these undergoes a physical change when heated strongly?

1. Copper (II) Nitrate
2. Ammonium chloride
3. Potassium chlorate
4. Zinc Oxide

50. Which of the following is/are true about polyethene?

1. It is a thermo - softening plastic
2. It is a thermosetting plastic
3. It is a hydrocarbon
4. It conducts heat and electricity