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**P545/1**

**CHEMISTRY**

**PAPER 1**

**1HOUR 30 MINUTES**

**END OF TERM II EXAMINATIONS, 2013**

**SENIOR THREE**

**CHEMISTRY**

**PAPER 1**

**1½ HOURS**

***INSTRUCTIONS***

- **This paper consists of 50 objective type questions.**
- **Answer all questions.**
- **You are required to write the correct answer A, B, C and D in the box provided on the right hand of each question.**

<b>FOR EXAMINERS USE ONLY</b>

- Which one of the following elements reacts with chlorine to form a covalent compound?
  - Calcium
  - Hydrogen
  - Copper
  - Zinc
- Which one of the following metals reacts with cold water slowly but vigorously with steam?
  - Lead
  - Copper
  - Magnesium
  - Calcium
- In which one of the following reactions is sulphuric acid behaving as an oxidizing agent?
  - $\text{H}_2\text{SO}_{4(\text{aq})} + \text{Mg}(\text{OH})_{2(\text{s})} \longrightarrow \text{MgSO}_{4(\text{aq})} + \text{H}_2\text{O}_{(1)}$
  - $\text{H}_2\text{SO}_{4(\text{aq})} + \text{CuCO}_{3(\text{s})} \longrightarrow \text{CuSO}_{4(\text{aq})} + \text{H}_2\text{O}_{(1)} + \text{CO}_{2(\text{g})}$
  - $\text{H}_2\text{SO}_{4(\text{aq})} + \text{CuO}_{(\text{s})} \longrightarrow \text{CuSO}_{4(\text{aq})} + \text{H}_2\text{O}_{(1)}$
  - $2\text{H}_2\text{SO}_{4(\text{aq})} + \text{C}_{(\text{s})} \longrightarrow 2\text{SO}_{2(\text{g})} + \text{CO}_{2(\text{g})} + 2\text{H}_2\text{O}_{(1)}$
- A strong acid is one which is;
  - Concentrated
  - gully ionized
  - Corrosive
  - not dilute
- Anhydrous zinc chloride can be prepared by reacting.
  - Zinc with dilute hydrochloric acid
  - Zinc with concentrated hydrochloric acid
  - Zinc with hydrogen chloride gas
  - Zinc oxide with hydrogen chloride gas.
- Which one of the following statements is true about basic oxides? They;
  - dissolve in water to form alkaline solutions
  - are reduced by cooking gas
  - turn most litmus paper red
  - react with acids to form a salt and water.
- An iodine atom becomes an iodide ion by
  - gaining one proton
  - losing one electron
  - gaining one electron
  - losing one proton

8. Which of the following equations represents the equation for the reaction which takes place in the removal of temporary hardness of water?

- A.  $\text{CaCO}_3(\text{s}) \longrightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
- B.  $\text{Ca}(\text{HCO}_3)_2(\text{aq}) \xrightarrow{\text{heat}} \text{CaCO}_3(\text{s}) + \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$
- C.  $\text{CaCO}_3(\text{s}) + 2\text{HCl}(\text{aq}) \longrightarrow \text{CaCl}_2(\text{aq}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
- D.  $\text{Pb}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) \longrightarrow \text{PbSO}_4(\text{s})$

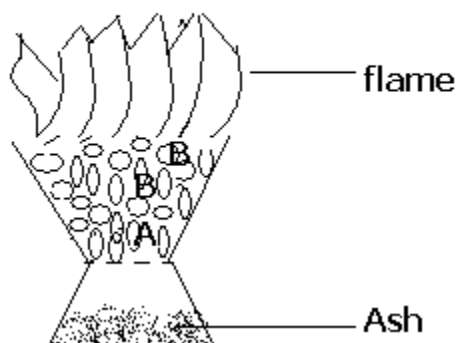
9. Which one of the following is an incorrect statement about the element hydrogen? It

- A. Reduces lead (ii) oxide to lead
- B. Is diatomic
- C. Explodes when mixed with air
- D. Does not form negatively charged ions,  $\text{H}^-$

10. Which one of the following hydrocarbons had the highest boiling point?

- A. Ethane      B. Propane      C. Pentane      D. Heptane

The figure below is to be used to answer questions 11 and 12.



11. Which of the following reactions takes place at B.?

- A.  $\text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l}) \longrightarrow \text{H}_2\text{CO}_3(\text{aq})$
- B.  $\text{CO}_2(\text{g}) + \text{C}(\text{s}) \longrightarrow 2\text{CO}(\text{g})$
- C.  $2\text{CO}(\text{g}) + \text{O}_2(\text{g}) \longrightarrow 2\text{CO}_2(\text{g})$
- D.  $\text{C}(\text{s}) + \text{O}_2(\text{g}) \longrightarrow \text{CO}_2(\text{g})$

12. What is the colour of the flame?
- A. Green flame                      B. Yellow flame  
C. Blue flame                        D. white flame
13. An element burns in air to form a colorless, odourless gaseous oxide. Magnesium burns in the oxide to form a white product and black particles. The element is likely to be.
- A. Phosphorous                      B. Sulphur  
C. Hydrogen                         D. Carbon
14. Which one of the following is a general formula for alkanes?
- A.  $C_nH_{2n}$                          B.  $C_nH_n$   
C.  $C_nH_{2n+2}$                       D.  $C_nH_{2n-2}$
15. Which one of the following elements does not exhibit allotropy?
- A. Sulphur                            B. Phosphorous  
C. Carbon                            D. Nitrogen
16. Which one of the following metals will displace iron from a solution of iron (II) sulphate most readily?
- A. Lead                                B. Copper  
C. Zinc                                D. Magnesium
17. Which one of the following pair of elements can conveniently be used to prepare lead (II) sulphate?
- A. Lead (II) oxide with dilute sulphuric acid  
B. Lead (II) carbonate and dilute sulphuric acid  
C. a mixture of lead and dilute sulphuric acid  
D. a mixture of lead nitrate solution and sodium sulphate solution.
18. Which one of the following best explains why graphite and diamond differ?
- A. Graphite is impure carbon  
B. Their densities are not the same  
C. All the four valency electrons of graphite are used in covalent bonding.  
D. The atomic structures are different.
19. In which of the following processes does oxidation not occur?

- A. Burning of biogas
  - B. Rusting of iron
  - C. Melting of candle wax
  - D. Smouldering of phosphorus.
20. Which one of the following substance can be obtained by a process of hydrogenation of oil?
- A. Petroleum
  - B. Margerine
  - C. Soap
  - D. Rubber
21. The solubility of a solute can be increased by
- A. agitating the mixture
  - B. adding more solute
  - C. adding more solvent
  - D. increasing the temperature
22. Condensation process is best defined as
- A. change from gas to liquid
  - B. a substance cooling and losing kinetic energy
  - C. the constant temperature at which a liquid boils
  - D. the particles coming close together to one another.
23. Which one of the following carbonates does not decompose on heating?
- A. Sodium carbonate
  - B. Zinc carbonate
  - C. Magnesium carbonate
  - D. Calcium carbonate
24. The valency of X in  $X_2(SO_4)_3$  is;
- A. 2
  - B. 3
  - C. 4
  - D. 5
25. Carbon monoxide can be obtained from carbon dioxide by
- A. heating carbon dioxide in the absence of air
  - B. passing carbon dioxide over heated carbon
  - C. heating a mixture of carbon dioxide and steam
  - D. passing carbon dioxide over heated copper.
26. The most efficient method of separating a mixture of copper (II) sulphate and lead (II) sulphate is by;
- A. decantation
  - B. sublimation
  - C. filtration
  - D. crystallization
27. The trend which is observed on moving from left to right across a period in the periodic table is that the

- A. non-metallic character increases  
B. metallic character increases  
C. number of energy levels decreases  
D. number of energy level increases
28. When heated strongly, lead (II) nitrate leaves a solid residue whose colour is;  
A. reddish – brown (hot), grey (cold)  
B. yellow (hot), white (cold)  
C. reddish –brown (hot), yellow (cold)  
D. reddish-brown (hot, white (cold)
29. When smoke particles are viewed under a microscope the particles are seen.  
A. moving in a straight line    B. remained stationary  
C. moving randomly                D. stack together in elusters
30. Which one of the following substances will dissolve in water to give a solution that would turn red litmus paper blue?  
A. Sodium chloride                B. Sodium hydroxide  
C. Sodium sulphate                D. Sodium nitrate
31. Which one of the following equations represents an oxidation –reduction reaction?  
A.  $\text{H}^+_{(\text{aq})} + \text{OH}^-_{(\text{aq})} \longrightarrow \text{H}_2\text{O}_{(1)}$   
B.  $\text{Pb}^{2+}_{(\text{aq})} + \text{SO}_4^{2-}_{(\text{aq})} \longrightarrow \text{PbSO}_{4(\text{s})}$   
C.  $\text{Cu}^{2+}_{(\text{aq})} + \text{Fe}_{(\text{s})} \longrightarrow \text{Cu}_{(\text{s})} + \text{Fe}^{2+}_{(\text{aq})}$   
D.  $\text{Ca}^{2+}_{(\text{aq})} + \text{CO}_3^{2-}_{(\text{aq})} \longrightarrow \text{CaCO}_{3(\text{s})}$
32. The oxide that dissolves most readily in water is  
A. Sodium oxide                    B. Calcium oxide  
C. Lead (II) oxide                  D. Copper (II) oxide
33. Which one of the following is true about bases? All bases;  
A. are soluble in water            B. are hydroxides

- C. neutralize acids                      D. are oxides
34. Which one of the following substances is an element?
- A. Ice    B. Sand  
C. Graphite                                      D. Polythene
35. When substance X is heated in a test tube, it disappears from the bottom of the tube and reappears at the cooler parts of the test tube. The substance is likely to be.
- A. Silver    B. sodium chloride  
C. copper (II) chloride                      D. ammonium chloride
36. Which one of the following compounds dissolves in boiling water but it NOT readily soluble in cold water?
- A. Lead (II) carbonate                      B. Lead (II) chloride  
C. Lead (II) hydroxide                      D. Lead (II) sulphate
37. Which one of the following is the best test for the purity of a sample of water?
- A. determine its boiling point  
B. see whether it is colourless  
C. find out whether it turns white anhydrous copper (II) sulphate to blue  
D. find out whether sugar will dissolve in it.
38. When crude oil is distilled, several fractions are obtained. The final fraction is different from the other in that it;
- A. has a low boiling point                      B. is colourless  
C. pours easily                                      D. burns in air with difficulty
39. Which one of the following compound in water does not contain ions?
- A. Ethanol    B. Sodium chloride  
C. Sodium hydroxide                      D. Copper (II) chloride
40. Which one of the following shows a noble gas electron arrangement?
- A. 2:2    B. 2:8:2  
C. 2:8:8    D. 2:8:8:7

Each of the questions 41-45 consists of an assertion (statement) on the left hand side and a 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 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

- 41. Hydrogen reduces heated copper (II) oxide to copper **BECAUSE** Hydrogen is above copper in the reactivity series.
- 42. Ethane is a saturated hydrocarbon **BECAUSE** It contains a carbon to carbon double bond in its molecule
- 43. Magnesium has oxidation number of +2 **BECAUSE** Magnesium lacks six electrons to complete the octet structure.
- 44. Magnesium can displace copper from aqueous copper (II) sulphate **BECAUSE** The ions of both magnesium and copper carry a positive change of two
- 45. Nitric acid can be prepared by the acid on sodium nitrate **BECAUSE** Nitric acid is less volatile than sulphuric acid

In each of the questions 46-50 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, 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
46. Which of the following is/are observed when a mixture of copper (II) oxide and charcoal is heated?
1. Lime water remained colourless
  2. Lime water turned milky
  3. Black residue
  4. reddish-brown residue
47. Compounds belonging to the same homologous series
1. Conform to the same general formula
  2. Each member differs in molecular formula from the next
  3. Physical properties of members change gradually in the same direction along the series.
  4. Members show different chemical reactions.
48. The following salt(s) are/is formed by precipitation;
1. Magnesium chloride
  2. Zinc chloride
  3. Soap
  4. Lead (II) chloride
49. Solubility of potassium nitrate salt in water is increased by;
1. Increase in quantity of water
  2. Decrease in quantity of water
  3. Increase in temperature of solution
  4. Decrease in temperature of solution
50. Which of the following is observed when zinc (II) carbonate is strongly heated?
1. White solid turned yellow residue
  2. White solid turned orange residue
  3. Colourless gas evolved that turns blue litmus red (pink)
  4. Colourless gas evolved that turns red litmus blue.

**END**