

Name.....Stream.....

DEPARTMENT OF CHEMISTRY

CHEMISTRY PAPER ONE

545/1

Time: 1 hour 30 minutes

INSTRUCTIONS

- 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
- Do not use a pencil.

FOR EXAMINERS' USE ONLY

QUESTION	MARKS
Numbers 1 - 50	

1. Which one of the following defines chemistry?
- A. The study of matter and its properties  
B. This is the study of living and non living things  
C. the study of compound and mixtures  
D. This is the study of atmosphere and its surroundings.
2. Which one of the following metals will displace copper from copper(II) sulphate solution easily?
- A. magnesium  
B. silver  
C. mercury  
D. lead
3. 25cm<sup>3</sup> of 0.2 acid solutions was completely neutralized by 20cm<sup>3</sup> of 0.5m sodium hydroxide solution. The basicity of the acid is?
- A. 4                      B. 3                      C. 2                      D. 1



11. Which one of the following solutions can be softened by boiling?  
 A. Magnesium chloride solution  
 B. Calcium sulphate solution  
 C. Magnesium hydrogen carbonate solution  
 D. Calcium chloride solution

12. An oxide of a substance Z dissolved in water to form a solution that had a pH of 5. Z is likely to be.....  
 A. Na<sub>2</sub>O                      B. MgO                      C. SO<sub>2</sub>                      D. CO

13. Which one of the following reactions is a neutralization reaction?  
 A.  $Pb^{2+}(aq) + Cl^{-}(aq) \longrightarrow PbCl_2(s)$   
 B.  $CO_3^{2-}(aq) + 2H^{+}(aq) \longrightarrow H_2O(l) + CO_2(g)$   
 C.  $SO_3^{2-}(aq) + Ba^{2+}(aq) \longrightarrow BaSO_3(s)$   
 D.  $H^{+}(aq) + OH^{-}(aq) \longrightarrow H_2O(l)$

14. An atom of an element X has 16 protons, and 17 neutrons. The formula of the common ion of X is .....  
 A. X<sup>2-</sup> AGRICULTURE                      B. X<sup>2+</sup>                      C. X<sup>-</sup>                      D. X<sup>+</sup>.

15. The electronic structure of atom Y is shown below:

Which type of bonding exists in the chloride of Y?

- A. Electrovalent                      B. Metallic                      C. Dassive                      D. Covalent

16. An atom of an element P has mass number 37 and number of neutrons as 20.  
 The electronic configuration of the common ion of X is .....

- A. 2: 8: 8: 2                      B. 2: 8: 7  
 C. 2: 8: 8                      D. 2: 8: 8: 8: 8: 3

17. Group (I) elements are normally stored under oil because

- A. of their high reactivity with water and air.  
 B. they contain only one electron in their oute energy levels.  
 C. they form compounds by lose t heir electron to non-metals

D. of their strong affinity for oil

18. Which one of the following salts is not prepared by crystallization?  
A.  $\text{MgCO}_3$       B.  $\text{Na}_2\text{CO}_4$       C.  $\text{Pb}(\text{NO}_3)_2$       D.  $\text{CuCl}_2$
19. Which one of the following substances that absorbs water from the atmosphere and dissolves in it?  
A.  $\text{CaCl}_2$       B.  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$   
C.  $\text{MgCO}_3$       D.  $\text{ZnO}$
20. Which of the following elements have the same number of electrons in their outermost energy level?  
A. Li and B  
B. Mg and Ca  
C. He and H  
D. Al and Si
21. Which one of the following is true about electrodes during electrolysis?  
A. The conducting particles are ions  
B. The conducting particles are electrons  
C. They are decomposed by electric current  
D. They are normally inert
22. An oxide of an element X consist of 7.0g of X and 3.0 g of oxygen.  
The formular of the oxide is.....  
A.XO      B. X3O2      C. XO2      D. X2O3
23. Lead (II) carbonate was heated strongly in a hard glass tube until there was no further change. If 0.44 g of carbon dioxide were produced, the mass of Leads (II) carbonate that decomposed was.....  
(Pb = 207, C = 12, O = 16)  
A. 26.7      B. 1.335      C. 2.67      D. 0.267
24. Which one of the following are thee products formed when carbon dioxide is passed over heated magnesium?  
A.  $\text{Mg}_2$  : C and  $\text{O}_2$       B. Mg and CO  
C. Mg and C      D. Mg O and C
25. Which one of the following formed when excess carbon dioxide gas is bubbled through calcium hydroxide?

- A.  $\text{Ca}(\text{HCO}_3)_2$                       B.  $\text{CaCO}_3$                       C.  $\text{CaO}$                       D.  $\text{CaC}_2$

26. X is colourless gas with an irritating pungent smell and forms dense white fumes with hydrogen chloride, X is.....

- A.  $\text{N}_2$                       B.  $\text{NH}_3$                       C.  $\text{SO}_2$                       D.  $\text{SO}_3$ .

27. Compound Y dissolved in water to form a green solution which was then divided into two portions.

To the first portion a blue precipitate insoluble in excess addition of sodium hydroxide was observed.

When acidified barium nitrate was added to the 2<sup>nd</sup>, a white precipitate formed. Y was.....

- A.  $\text{CuSO}_4$                       B.  $\text{FeSO}_4$                       C.  $\text{CuCl}_2$                       D.  $\text{FeCl}_3$ .

28. In which one of the following equations is sulphuric acid behaving as an oxidizing agent?

- A.  $\text{Na}_2\text{CO}_3(\text{aq}) + \text{H}_2\text{SO}_4(\text{aq}) \longrightarrow \text{Na}_2\text{SO}_4(\text{aq}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$   
 B.  $2\text{KOH}(\text{aq}) + \text{H}_2\text{SO}_4(\text{aq}) \longrightarrow \text{K}_2\text{SO}_4(\text{aq}) + 2\text{H}_2\text{O}(\text{l})$   
 C.  $\text{Zn}(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \longrightarrow \text{ZnSO}_4(\text{aq}) + \text{H}_2(\text{l})$   
 D.  $\text{Cu}(\text{s}) + 2\text{H}_2\text{SO}_4(\text{aq}) \longrightarrow \text{CuSO}_4(\text{aq}) + \text{SO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$

29. Which one of the following is observed when excess ammonia was passed into a gas of chlorine?

- A. A yellow precipitate was formed  
 B. A cloudy solution as observed  
 C. Dense white fumes were observed  
 D. Colourless gas bubbles were observed

30. A substance X dissolved in water to form a solution whose pH was found to be 1. X is likely to be.....

- A.  $\text{HCl}$                       B.  $\text{NaOH}$                       C.  $\text{K}_2\text{CO}_3$                       D.  $\text{CH}_3\text{COOH}$

31. Steel an alloy of.....

- A. Carbon and magnesium                      B. Iron and copper  
 C. Iron and carbon                      D. Magnesium and copper

32. Which one of the following compound is a hydrocarbon?

- A.  $\text{C}_2\text{H}_6\text{O}$                       B.  $\text{CH}_3\text{NH}_2$                       C.  $\text{CH}_3\text{Cl}$                       D.  $\text{C}_2\text{H}_4$ .

33. Which one of the following metals is extracted by electrolysis?

- A.  $\text{Cu}$                       B.  $\text{Ag}$                       C.  $\text{Zn}$                       D.  $\text{K}$



### Instructions summarized

A	B	C	D
1, 2, 3 only	1, 3 only	2, 4 only	4 only

41. Which of the following is/are observed when lead (II) nitrate crystals are heated strongly until no further change?  
1. It melts to form a colourless liquid  
2. Cracking sound is heard  
3. Reddish brown fumes are given off  
4. A yellow solid turned brown on cooling
42. A solution of copper (II) sulphate was electrolysis using carbon electrodes. Which of the following is/are true?  
1. A brown solid was deposited on the cathode  
2. The anode reduced in size  
3. Bubbles of a colourless gas were observed at the anode  
4. The solution around the cathode became more alkaline
43. Which of the following is /are formed when sulphur dioxide is mixed with hydrogen sulphide?  
1. Hydrogen      2. Sulphur      3. Sulphur trioxide      4. Water
44. Which of the following is/are properties that determine the purity of water?  
1. It has a freezing point of 0°C  
2. It has a density of 1g/cm<sup>3</sup> at 4°C  
3. It has boiling point of 100°C  
4. it is colourless and clear
45. Which of the following is/are properties/ property of covalent compounds?  
1. They have low melting points  
2. They conduct electricity in molten state  
3. They are insoluble in polar solvents  
4. They form compounds by transfer of electrons.

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. Choose:-

- A. If both assertion and reason are true statements and the reason is a correct explanation of the assertion  
B. If both assertion and reason are true statement but the reason is a correct Explanation of the assertion  
C. If the assertion is true but the reason is incorrect statement  
D. If the assertion is incorrect but the reason is a true statement

46. Sodium chloride is prepared by crystallization Because it is a soluble salt.
47. Alkenes are normally used as fuels Because They are hydro carbons.
48. Chlorine, bromine and iodine  
1. are all gases at room temperature  
2. form ions with a single negative charge  
3. Are very soluble in water  
4. are salt makers
49. The sulphate which are readily soluble in water are:  
1. Sodium sulphate  
2. Lead (II) sulphate  
3. Zinc sulphate  
4. Barium sulphate
50. Boiling water that contains calcium hydrogen carbonate does not soften it Because Boiling decomposes the calcium hydrogen carbonate into insoluble calcium carbonate.

END