GUNDECHA EDUCATION ACADEMY

COMMON PRELIMINARY EXAMINATION-2018-2019

STD: X
(2 hours)

DATE: 17-01-19
Marks: 80

CHEMISTRY
SCIENCE PAPER -2
(Two Hours)

Answer to this paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this paper is the time allowed for writing the answers.

Section I** is compulsory. Attempt **any four questions from Section II.

The intended marks for questions or parts of questions are given in brackets [ ]

SECTION I (40 Marks)
Attempt all questions from this section.

Question 1

a) Select the correct answer from the choices given in each case: [10]

1. Ionization potential increases across a period from left to right because the:
   a. Atomic radius increases and nuclear charge increases
   b. Atomic radius decreases and nuclear charge decreases
   c. Atomic radius increases and nuclear charge decreases
   d. Atomic radius decreases and nuclear charge increases
2. A compound X consists of only molecules. Hence X will have:
   a. A crystalline hard structure
   b. A low melting point and low boiling point
   c. An ionic bond
   d. A strong force of attraction between its molecules
3. An acid which is not a hydracid is :
   a. H_2S
   b. H_2SO_3
   c. HBr
   d. HCl
4. Which one of the following salt solutions on reaction with excess sodium hydroxide solution gives a clear solution finally?
   a. $Pb(NO_3)_2$ (aq)
   b. $CuSO_4$ (aq)
   c. $FeCl_3$ (aq)
   d. $FeSO_4$ (aq)

5. The vapour density of carbon dioxide [C = 12, O = 16] is :
   a. 12
   b. 16
   c. 44
   d. 22

6. When dilute sodium chloride is electrolysed using graphite electrodes, the cation discharged at the cathode most readily is :
   a. Na^+
   b. OH^-
   c. Cl^-
   d. H^+

7. Sulphide ore is generally concentrated by:
   a. Hydrolytic method
   b. Roasting
   c. Calcination
   d. Froth floatation process

8. Stainless steel does not contain:
   a. Cr
   b. Al
   c. C
   d. Ni

9. The main ore used for the extraction of iron is:
   a. Iron pyrites
   b. Magnetite
   c. Bauxite
   d. Haematite

10. The organic compound mixed with ethanol to make it spurious is :
   a. Methanal
   b. Methanoic acid
   c. Methanol
   d. Ethanoic acid

b) Give a suitable word/ chemical term for the following: [5]

1. A bond formed by a shared pair of electrons with both electrons coming from the same atom.
2. A metallic hydroxide which is insoluble in caustic soda but soluble in excess of NH_4OH.
3. Electrolytic deposition of a superior metal on a baser metal.
4. A reaction in which hydrogen of an alkane is replaced by a halogen.
5. A solution which can absorb oxygen.

c) State the observation for each of the following. [5]

1. Ammonium hydroxide is added to copper (II) nitrate solution in small quantities and then in excess.
2. Hot and conc.nitric acid is added to sulphur.
3. Hydrogen chloride gas comes in contact with ammonia solution.
4. Ethyne is bubbled through a solution of bromine in carbon tetrachloride.
5. Sulphur dioxide is bubbled through acidified $KMnO_4$ solution.

d) Write balanced equations for the following reactions: [5]

1. Lead (II) chloride from lead nitrate.
2. Aluminium reacts with hot conc. KOH.
3. Reaction of dilute hydrochloric acid with manganese dioxide.
4. Catalytic oxidation of ammonia.
5. Reaction between ethyl alcohol and acetic acid.

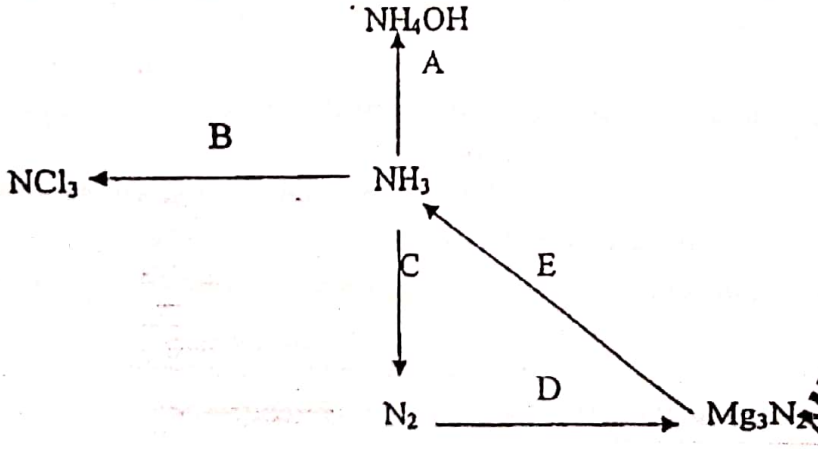
e) Give the structural formula of the following: [5]

1. But-2-yne
2. 1-chloro-2-methyl propane
3. Propanoic acid
4. Ethanal
5. 1,2- dibromoethane

f) Differentiate between: [5]

1. Alkanes and Alkynes [general formula]
2. Baeyer's process and Hall Heroult's process [Method used]
3. Electrolytic dissociation and Ionisation [Definition]
4. Common acid – base indicators and Universal indicators [utility]
5. Atomic size and Ionisation potential [Trend in character down the group]

g) How are the following conversions carried out? Give equations only: [5]



SECTION II (40 marks)

Attempt any four questions from this section

Question 2

a) Give a reason for each of the following: [5]

1. Noble gases have zero electron affinity values.
2. Mercury is a liquid and allows the flow of electricity, though it is not an electrolyte.
3. Dilute hydrochloric acid cannot be concentrated by distilling or boiling the dilute acid.
4. Nitric acid stains the skin yellow if dropped on skin.
5. It is dangerous to burn methane in an insufficient supply of air.

b) The electron arrangement of three atoms P, Q and R is (2, 8, 8, 1), (2, 8, 6) and (2, 8, 18, 7) respectively.

1. Write down the formula of the molecule of R and its electron dot diagram. [2]
2. Write the formula of compound between P and R and the type of bonding. [2]
3. Is the compound of Q and R good conductor or bad conductor of electricity? [1]

Question 3

a) A compound has the following percentage composition by mass:
Carbon- 54.60%, Hydrogen- 9.09% and Oxygen- 36.31%. Its vapour density is 44. Find the empirical and molecular formula of the compound. [5]

b) Complete the following reactions: [3]

1. $Cu \longrightarrow Cu^{2+}$
2. $Fe^{3+} \longrightarrow Fe^{2+}$
3. $Cl^{-} \longrightarrow Cl$

c) Write a balanced equation for a reaction in which ammonia is oxidized by: [2]

1. A metal oxide.
2. A gas which is not oxygen.

Question 4

a) Salts A, B and C undergo reactions 1 to 3 respectively. Identify the anion present in these salts on the basis of these reactions. [3]

1. When silver nitrate solution is added to a solution of A, a white precipitate, insoluble in dilute nitric acid, is formed.
2. Addition of dilute hydrochloric acid to B produces a gas which turns lead acetate paper black.
3. When a freshly prepared solution of ferrous sulphate is added to a solution of C and concentrated sulphuric acid is gently poured from the side of the test tube, a brown ring is formed.

1. Of the two gases, ammonia and hydrogen chloride, which is more dense? Name the method of collection of this gas. [2]
2. Why is hydrogen chloride gas not collected over water? [1]
3. Write an equation to show how nitric acid undergoes decomposition [1]
4. Write the equation for the reaction in which copper is oxidized by concentrated nitric acid. [1]

b) Calculate the number of moles and the number of molecules present in 1.4 g of ethylene. [2]

Question 5

a) In the laboratory or industrially, the first step in the conversion of sulphur to sulphuric acid is to produce sulphur dioxide. Then sulphur dioxide is converted to sulphur trioxide which reacts with water producing sulphuric acid. [4]

1. Name one catalyst used industrially which speeds up the conversion of sulphur dioxide to sulphur trioxide.
2. Write the equation for the conversion of sulphur dioxide to sulphur trioxide. Why does this reaction supply energy?
3. What is the name of the compound formed between sulphur trioxide and sulphuric acid?

b) Solutions A, B, C, D and E have the pH values 2, 6, 7, 8 and 9 respectively. Which solution would : [4]

1. liberate hydrogen with zinc metal;
2. produce ammonia when heated with NH_4Cl;
3. contain molecules and ions;
4. remain neutral to litmus?

c) What happens to the impurities of the anode during electro refining of crude metals? [2]

Question 6

a) For each substance listed below, explain its significance in the extraction of aluminium. [3]

1. Cryolite
2. Sodium hydroxide
3. Powdered coke

b) Write equations for: [2]

1. Preparation of ethanol by hydrolysis of chloroethane with aq. sodium hydroxide.
2. Preparation of acetic acid from ethanol.

c) Draw a neat labelled diagram showing copper plating on spoon. [2]

d) Define the following terms: [3]

1. Electro negativity
2. Amalgam
3. Dehydration

Question 7

a) Answer the following with respect to group VII A elements in the periodic table. [3]

1. the liquid halogen;
2. gaseous halogen having greenish yellow colour and
3. the halogen with electronic configuration (2,7).

b) From the equation $CaCO_3 + 2HCl \longrightarrow CaCl_2 + H_2O + CO_2$. Calculate the weight of $CaCl_2$ obtained from 10 g of $CaCO_3$ and the volume at s.t.p. of CO_2 obtained at a same time. [Ca = 40, C = 12, O = 16, Cl = 35.5] [2]

c) Some methods used for the laboratory preparation of salts are: [5]

A : Metal + acid
B : Carbonate + acid
C : Direct Combination
D : Precipitation
E: Titration

Copy and complete the following table:

Salt	Method of preparation
1. Ammonium sulphate	
2. Lead chloride	
3. Iron (II) sulphide	
4. Zinc sulphate	
5. Copper sulphate	