

## ATOMIC STRUCTURE

1. Discuss about Rutherford's atomic model. What are the drawbacks of Rutherford's atomic model?
2. State and explain Aufbau principle.
3. Discuss about Bohr's atomic model.
4. Write the electronic configuration of  $\text{Cu}^{2+}$  and Fe.
5. What is the mass of electron?
6. Proton was discovered by -----
7. Calculate the no. of proton, electron and neutron of the following compounds.
8. Define isotopes, isobar, isotones with examples.
9. Name the orbital
  - a)  $n=1, l=0$
  - b)  $n=2, l=1$
10. Arrange the following subshells in the increasing order of their energy.  
 $2s, 3d, 4s, 2p, 5s, 3s$

## CHEMICAL BONDING

1. Define covalent bond with an example.
2. Discuss the structure of  $\text{CH}_4$  and  $\text{NH}_4^+$ .
3. Describe the characteristics of electrovalent compounds.
4. Define chemical bonding.
5. How a co-ordinate bond is formed? Explain with an example.

## CONCEPT OF ACIDS AND BASES

1. State Arrhenius concept of acid and bases.
2. Explain Bronsted-Lowry concept of acid and bases.
3. Write down the conjugate acid of following substances  
 $\text{Cl}^-$ ,  $\text{H}_2\text{O}$ ,  $\text{OH}^-$
4. Define acidic, basic, double and mixed salts with examples.

5. Find out the equivalent mass of sulphuric acid, NaOH,  $K_2CO_3$  .
6. Define normality and molarity.
7. Calculate molality of potassium carbonate solution which is formed by dissolving 2.51g of it in 1 ltr solution (density of solution is 0.85 g/ml).
8. Define  $p^H$ .
9. Calculate  $p^H$  of  $10^{-8}$  M HCl.
10. 2.45 g of sulphuric acid is present in 250 ml of the solution. Calculate the  $p^H$  value of the solution.
11. Discuss the importance of  $p^H$  value in sugar industries.

### ELECTROCHEMISTRY

1. Define electrolytes .
2. What is electrolysis? Discuss the procedure of electrolysis.
3. State and explain faraday`s 1<sup>st</sup> and 2<sup>nd</sup> law of electrolysis.
4. Find the mass of copper deposited from copper sulphate solution by a current of 0.25 amp flowing for 1 hr. At. Mass of Cu is 63.
5. Discuss about electrorefining.

### CORROSION

1. Define corrosion and explain the mechanism of atmospheric corrosion.
2. Write notes on waterline corrosion,
3. What is galvanization?
4. Why rusting of iron is quicker in saline water?

### METALLURGY & ALLOYS

1. Define metallurgy. Discuss different steps of metallurgy.
2. Discuss froath floatation method magnetic separation method.
3. Define calcination and roasting.
4. What is smelting?
5. What is flux and slag?
6. Define alloys.
7. What is ferro alloys and non-ferro alloys. Give examples of each.
8. What is amalgams?
9. Write the composition and uses of brass, bronze, duralumin, alnico and steel.

### HYDROCARBONS

1. Which of the following is the correct IUPAC name?
  - a. 3-Ethyl-4, 4-dimethylheptane
  - b. 4,4-Dimethyl-3-ethylheptane
  - c. 5-Ethyl-4, 4-dimethylheptane
  
2. Write down the uses of following aromatic compounds
  - i. Benzene
  - ii. Toluene
  - iii. BHC
  - iv. Phenol
  - v. Naphthalene
  - vi. Anthracene
  - vii. Benzoic acid

### WATER

1. Define hard and soft water. Explain how hard water can be softened by ion exchange process.
2. What do you mean by hardness of water? What is the difference between hard and soft water?
3. What are the advantages of lime soda process?
4. What is temporary and permanent hardness? How temporary hardness can be removed?
5. Explain lime soda process.

### LUBRICANTS & FUEL

1. Define the term "Lubricant" and write its important functions.
2. Describe the composition and uses of water gas, producer gas, LPG, CNG and Coal gas.
3. Define calorific value of fuel. State important characteristics of a good fuel.

### POLYMER

1. Explain the terms monomer, polymer, homopolymer, copolymer and degree of polymerization.
2. What is vulcanization of rubber?

3. Write down the composition and uses of polythene, Polyvinyl chloride(PVC), Bakelite.
4. Define degree of polymerization with an example.

#### CHEMICALS IN AGRICULTURE

1. What is insecticides? Give two examples.
2. What is herbicides? Give two examples.
3. What is fungicides? Give two examples.
4. What is biofertilisers? Give two examples of biofertilizers. Write down the uses of biofertilizers.