Metals and Non-Metals

1 Mark:

1. Metals generally occur in solid state. Name and write symbol of a metal that exists in liquid state at room temperature. **[CBSE Sample Paper 2008]**

2. Alloys are used in electrical heating devices rather than pure metals. Give one reason. **[CBSE Sample Paper 2008]**

3 Marks:

1. No chemical reaction takes place when granules of a solid, *A*, are mixed with the powder of another solid, *B*. However when the mixture is heated, a reaction takes place between its components. One of the products, *C*, is a metal and settles down in the molten state while the other product, *D*, floats over it. It was observed that the reaction is highly exothermic.
   I. Based on the given information make an assumption about *A* and *B* and write a chemical equation for the chemical reaction indicating the conditions of reaction, physical state of reactants and products and the thermal status of reaction.
   II. Mention any two types of reactions under which above chemical reaction can be classified. **[CBSE, 2008]**

5 Marks:

1. Explain how the following metals are obtained from their compounds by the reduction process :
   I. Metal *M* which is in the middle of the reactivity series.
   II. Metal *N* which is high up in the reactivity series.
   Give one example of each type. **[CBSE, 2009]**

2. What is meant by refining of a metals? Name the most widely used method of refining impure metals produced by various reduction processes. Describe with the help of a labelled diagram how this method may be used for refining of copper.' **[CBSE, 2010]**

3. Four metals A, B, C and D are, in turn, added to the following solutions one by one. The observations made are tabulatd below: **[CBSE sample paper 2008]**

Metal	Iron (I) Sulphate	Copper (I) Sulphate	Zinc Sulphate	Silver Nitrate
A	No reaction	Displacement	–	–
B	Displacement	–	No reaction	–
C	No reaction	No reaction	No reaction	Displacement
D	No reaction	No reaction	No reaction	No reaction

Answer the following questions based on above information.

I. Which is the most active metal and why?
II. What would be observed if B is added to a solution of copper (II) sulphate and why?
III. Arrange the metals A, B, C and D in order of increasing reactivity.
IV. Container of which metal can be used to store both zinc sulphate solution and silver nitrate solution.
V. Which of the above solutions can be easily stored in a container made up of any of these metals?

OR

You are given the following materials:

I. Iron nails
II. Copper sulphate solution
III. Barium chloride solution
IV. Copper powder
V. Ferrous sulphate crystals
VI. Quick Lime

Identify the type of chemical reaction taking place when.

a) Barium chloride solution is mixed with copper sulphate solution and a white precipitate is observed.
b) On heating copper powder in air in a China dish, the surface of copper powder turns black.
c) On heating green coloured ferrous sulphate crystals, reddish brown solid is left and smell of a gas having odour of burning sulphur is experienced.
d) Iron nails when left dipped in blue copper sulphate solution become brownish in colour and the blue colour of copper sulphate fades away.
e) Quick lime reacts vigorously with water releasing a large amount of heat.

4. a) What is reactivity series? How does the reactivity series of metals help in predicting the relative activities of various metals?
   b) Suggest different chemical processes used for obtaining a metal from its oxides for metals in the middle of the reactivity series and metals towards the top of the reactivity series. Support your answer with one example each.

[CBSE Sample Paper 2017]