Materials Metals and Non-Metals

Q.1Which of the following can be beaten into thin sheets?
(a)Zinc (b) Phosphorus (c) Sulphur (d) Oxygen.
Sol: (a) Zinc

Q.2 Which of the following statements is correct?
(a) All metals are ductile.
(b) All non-metals are ductile.
(c) Generally, metals are ductile.
(d) Some non-metals are ductile.
Sol: (c) Generally, metals are ductile.

Q.3 Fill in the blanks in the following statements.
(a) Phosphorus is a very _____ non-metal.
(b) Metals are _____ conductors of heat and _____.
(c) Iron is _____ reactive than copper.
(d) Metals react with acids to produce _____ gas.
Sol: Fill in the blanks in the following statements.
(a) Phosphorus is a very **reactive** non-metal.
(b) Metals are **good** conductors of heat and **electricity**.
(c) Iron is **more** reactive than copper.
(d) Metals react with acids to produce **hydrogen** gas.

Q.4 Mark 'T' if the statement is true and 'F' if it is false.
(a) Generally, non-metals react with acids. ( )
(b) Sodium is a very reactive metal. ( )
(c) Copper displaces zinc from zinc sulphate solution. ( )
(d) Coal can be drawn into wires. ( )
Sol:
(a) Generally, non-metals react with acids. (F)
(b) Sodium is a very reactive metal. (T)
(c) Copper displaces zinc from zinc sulphate solution. (F)
(d) Coal can be drawn into wires. (F)

Q.5 Some properties are listed in the following Table. Distinguish between metals and non-metals on the basis of these properties.

Properties	Metals	Non-metals
1. Appearance 2. Hardness 3. Malleability 4. Ductility 5. Heat Conduction 6. Conduction of Electricity	Lecture	Dull and rough

Sol:

Properties	Metals	Non-metals
1. Appearance	Lecture	Dull and rough
2. Hardness	Hard	Soft
3. Malleability	Malleable	Non-malleable
4. Ductility	Ductile	Non-ductile
5. Heat Conduction	Good	Bad
6. Conduction of Electricity	Good	Bad

Q.6 Give reasons for the following.
(a) Aluminium foils are used to wrap food items.
(b) Immersion rods for heating liquids are made up of metallic substances.
(c) Copper cannot displace zinc from its salt solution.
(d) Sodium and potassium are stored in kerosene.

Sol:
(a) Aluminium foils are used to wrap food items because it has malleable property. So, it can be drawn into thin sheets.
(b) Immersion rods for heating liquids are made of metallic substances because metals are very good conductors of heat and electricity. It can get hot very fast and warm the water quickly.
(c) Copper cannot displace Zinc from its salt solution because Copper is lesser reactive than Zinc.
(d) Sodium and potassium are stored in kerosene because these metals are highly reactive with oxygen and water present in air.

Q.7 Can you store lemon pickle in an aluminium utensil? Explain.
Sol: Lemon pickle cannot be stored in aluminium utensils because aluminium is metal and lemon pickle contains acids. When acids react with metals liberating hydrogen has which will lead to spoilage of pickle.

Q.8 In the following table some substances are given in column I. In column II some uses are given. Match the items in column I with Those in Column II.

Column I	Column II
(i) Gold	**(a) Thermometers**
(ii) Iron	**(b)Electric wire**
(iii) Aluminum	**(c)Wrapping food**
(iv) Carbon	**(d)Jewelry**
(v) Copper	**(e)Machinery**
(vi) Mercury	**(f)Fuel**

Sol:

Column I	Column II
(i) Gold	(d) Jewelry
(ii) Iron	(e) Machinery
(iii) Aluminum	(c) Wrapping food
(iv) Carbon	(f) Fuel
(v) Copper	(b)Electric wire
(vi) Mercury	(a) Thermometers

Q.9 What happens when
(a) Dilute sulphuric acid is poured on a copper plate?
(b) Iron nails are placed in copper sulphate solution? Write word equations of the reactions involved.

Sol:
(a) When dilute sulphuric acid is poured on a copper plate, the copper (Cu) metal reacts with sulphuric acid (H_2SO_4) and produce Copper sulphate ($CuSO_4$) salt solution and produce hydrogen gas (H_2).

$$Cu(s) + H_2SO_4(dil.) \text{----------} > CuSO_4(aq.) + H_2(g)$$

(b)When iron nail is placed in copper sulphate solution. Since iron is more reactive than Copper. So, iron displaces copper form the compound copper sulphate solution forming copper and Iron sulphate solution.

$$Fe(s) + CuSO_4(aq.) \text{----------} > FeSO_4(aq.) + Cu(s)$$

Q.10 Saloni took a piece of burning charcoal and collected the gas evolved in a test tube.
(a) How will she find the nature of the gas?
(b) Write down word equations of all the reactions taking place in this process.
Sol:
(a) Firstly she should add a few drops of water in the test tube which contains gas. Gas is dissolved in water. Now, she should test the solution with blue litmus paper. It turns the blue litmus paper into red that indicates acidic nature of gas.

(b) Burning of charcoal liberates Carbon dioxide gas
Carbon from charcoal + Oxygen → Carbon dioxide
Carbon dioxide gas reacts with water to form carbonic acid, which turns blue litmus red.
Carbon dioxide + water ------> carbonic acid

Q.11. One day Reeta went to a jeweler's shop with her mother. Her mother gave an old gold jewelry to the goldsmith to polish. Next day when they brought the jewelry back, they found that there was a slight loss in its weight. Can you suggest a reason for the loss in weight?
Sol: To polish, old gold jewellery is dipped in a acidic solution called Aquaregia (mixture of HNO_3 and HCl in ratio 1:3). The outer layer of the jewellery is dissolved in Aquaregia. This loss of outer layer causes loss in weight of the gold jewellery.