

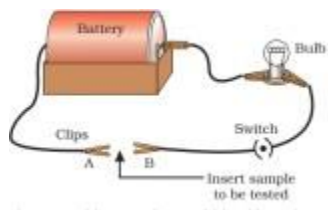


### MULTIPLE CHOICE QUESTIONS

- Which of the following represents the correct order of reactivity for the given metals?
  - Na>Mg>Al>Cu
  - Mg>Na>Al>Cu
  - Na>Mg>Cu>Al
  - Mg>Al>Na>Cu
- Ionic compounds are soluble in\_\_\_\_\_
  - Kerosene
  - Petrol
  - Water
  - None of these
- Which of the following statements is correct about ionic compounds?
  - They conduct electricity in solid state.
  - They conduct electricity in aqueous solutions.
  - They conduct electricity in molten state.
  - I only
  - II only
  - III only
  - II and III
- An element 'X' after reacting with acids liberates hydrogen gas and can displace lead and mercury from their salt solutions. The metal 'X' is \_\_\_\_\_
  - copper
  - gold
  - calcium
  - hydrogen

5. Aluminium is used for making cooking utensils. Which of the following properties of aluminium are responsible for the same?
- Good thermal conductivity
  - Good electrical conductivity
  - Ductility
  - High melting point
- i and ii
  - i and iii
  - ii and iii
  - i and iv
6. Which of the following is amphoteric in nature?
- Both aluminium oxide and zinc oxide
  - Only Zinc oxide
  - Only Aluminium oxide
  - Neither of them
7. A metal which does not react even with steam.
- Copper
  - Sodium
  - Magnesium
  - Aluminium
8. The electronic configuration of three elements X, Y and Z are as follows:  
 $X = 2, 4, Y = 2, 7, Z = 2, 1$   
Which two elements will combine to form an ionic compound and write the correct formula,
- $X_2Y$
  - $ZY$
  - $XZ_3$
  - $Y_2Z$
9. Hydrogen gas is not evolved when a metal reacts with nitric acid. But \_\_\_\_\_ and \_\_\_\_\_ react with very dilute  $HNO_3$  to evolve  $H_2$  gas.
- Pb, Cu
  - Na, K
  - Mg, Mn
  - Al, Zn

10. Observe the figure carefully and indicate the most suitable sample which would allow the bulb to glow.



- a. Non-metals
- b. Metals
- c. Metalloids
- d. None of the above

### **ASSERTION REASON TYPE QUESTIONS**

Following questions consist of two statements – Assertion and Reason

Answer these questions selecting the appropriate option given below:

- a. Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c. Assertion is true but Reason is false.
- d. Assertion is false but Reason is true

11. Assertion: Magnesium chloride is an ionic compound.

Reason: Metals and non-metals react by mutual transfer of electrons.

12. Assertion: Zinc can easily displace copper on reacting with a solution of copper sulphate.

Reason: Copper is more reactive metal as compared to Zinc.

13. Assertion: Elements Pt, Ag, and Au occur in native state in nature.

Reason: Elements which are attacked by moisture, oxygen and CO<sub>2</sub> of air occur in native state

14. Assertion: CaCl<sub>2</sub>, is a covalent compound.

Reason: CaCl<sub>2</sub> is a good conductor of electricity in molten state.

15. Assertion: The arrangement of metals in order of decreasing reactivities is called reactivity series.

Reason: Metals at the top of series are very reactive and metals at the bottom are least reactive

### **CASE STUDY BASED QUESTIONS**

Metals can be arranged in a series of their reactivity. This series is called reactivity series. Metals at the top of the series are very reactive and therefore they do not occur free in nature. The metals at the bottom of the series are least reactive and therefore occur free in nature. Metals more reactive than

hydrogen reacts with acids to give  $H_2$ , while metals less reactive than hydrogen do not react with acids to give  $H_2$

Answer the following questions based on the reactivity series given below.

16. Least reactive metal among Na, Cu, Au, Ag is \_\_\_\_\_
- Sodium
  - Copper
  - Gold
  - Silver
17. A copper plate is dipped in silver nitrate solution, the result observed is \_\_\_\_\_
- Silver is displaced by copper
  - Silver displaces copper
  - No reaction takes place
  - Nitric acid is formed
18. Sodium is stored in kerosene oil because \_\_\_\_\_
- it is least reactive metal
  - it is very reactive metal and explodes when comes in contact with air.
  - it evaporates in open.
  - none of the above.
19. Which among the following metals can displace H from HCl solution?
- Al
  - Cu
  - Au
  - Ag
20. A solution which can dissolve gold.
- Con. HCl
  - Con.  $HNO_3$
  - Con.  $H_2SO_4$
  - Con. HCl and Con.  $HNO_3$

### **1 MARK QUESTION**

21. Write one example of each of the following.  
The metal with the highest melting point and the metal with the lowest melting point
22. Which metal will melt at body temperature?
23.  $X + YSO_4 \longrightarrow XSO_4 + Y$  and  $Y + XSO_4 \longrightarrow$  No reaction  
Out of the two elements X and Y, which is more reactive and why?

24. Gold ornaments retain their lustre even after several years of use.

25. C does not react with the oxide of Na or Mg. Give reason.

### **3 MARKS QUESTIONS**

26. State the reason for the following:

- Hydrogen gas is not evolved when most metals react with nitric acid
- Calcium does not occur in a free state in nature.
- Reactivity of aluminium decreases if it is dipped in nitric acid

27. Explain the following statements.

- Most metal oxides are insoluble in the water. But some of these dissolve in water. What is the nature of these oxides and what is the solution in water known as?
- At ordinary temperature, the surface of metals like Magnesium, Aluminium, Zinc etc. is covered with a thin layer. What is the composition of this layer and what is its importance?
- Some alkali metals can be cut with a knife.

28. a. Define reactivity series of metals.

- Arrange the metals Gold, Copper, Iron and Magnesium in the order of their increasing reactivity.
- What will you observe when some silver pieces are placed in green coloured Ferrous sulphate solution?

### **5 MARKS**

29. A metal E (atomic number 11) is stored under kerosene oil. When a small piece of it is exposed in air it catches fire. When the product formed is dissolved in water it turns red litmus blue.

- Name the metal E.
- Write the chemical equation for the reaction when the metal is exposed to air and the product is dissolved in water.
- Write two properties of the compound formed when metal E reacts with  $\text{Cl}_2$ .

30. a. Explain the formation of Aluminium oxide with electron-dot structure.

(Given atomic number of Al and O are 13 and 8 respectively)

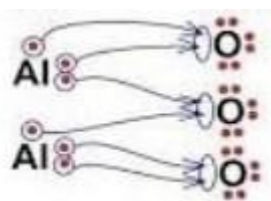
- What happens when (report only observations)
  - a reactive metal reacts with a dilute mineral acid
  - an amphoteric oxide reacts with NaOH solution
  - a less reactive metal is dropped in a solution of high reactive metal salt solution
  - a metal carbonate is treated with acid.

## PREVIOUS BOARD EXAM QUESTIONS

31. A non-metal X exists in two different forms Y and Z. Y is the hardest natural substance whereas Z is a good conductor of electricity. Identify X, Y and Z
32. Name any one metal which reacts neither cold water or hot water but reacts with heated steam to produce H<sub>2</sub> gas.
33. An element A forms two oxides AO and AO<sub>2</sub>. The oxides AO is neutral whereas the oxide AO<sub>2</sub> is acidic in nature. Would you call element A as a metal or a non-metal?
34. Calcium metal after reacting with water starts floating on the surface. Write the chemical equation for the reaction. Name one more metal that starts floating after sometime when immersed in water.
35. When a metal X is treated with cold water, it gives a base Y with molecular formula XOH (Molecular mass = 40) and liberates a gas Z which easily catches fire. Identify X, Y and Z.
36. A substance X which is an oxide of a metal is used intensively in the cement industry. This element is present in bones. On treatment with water, it forms a solution which turns red litmus blue. Identify X and also write the chemical reactions involved.

Q.NO	ANSWERS	MARKS
1	A	1
2	C	1
3	D	1
4	C	1
5	D	1
6	A	1
7	A	1
8	B	1
9	C	1
10	b	1
11	A	1
12	C	1
13	C	1
14	D	1
15	B	1
16	c	1
17	A	1
18	B	1
19	A	1

20	D	1
21	Melting point of Tungsten is the highest and Mercury is the lowest	1
22	Gallium	1
23	X is more reactive than Y because it replaces Y from its salt solution.	1
24	Gold is an unreactive metal it does not react with atmospheric oxygen and acids so the luster of gold jewellery is retained even after several years.	1
25	C is less reactive than Na or Mg.	1
26	a. Nitric acid being a strong oxidizing agent oxidises the hydrogen produced to water. b. Calcium is a fairly reactive metal hence it forms compounds easily and is not seen in free state in nature. c. Al reacts with dilute Nitric acid to form an oxide. This layer prevents further reaction of Aluminium	1 1 1
27	a. Metal Oxides are basic in nature. Alkali b. Metal oxides and they protect the metal from corrosion c. Alkali metals are soft metals	1 1 1
28	a. The series of metals arranged in the decreasing order of reactivity is known as the reactivity series of metals. b. Magnesium > Iron > Copper > Gold c. No characteristic observation as silver is less reactive than iron.	1 1 1
29	a. Sodium b. $4\text{Na} + \text{O}_2 \longrightarrow 2\text{Na}_2\text{O}$ $\text{Na}_2\text{O} + \text{H}_2\text{O} \longrightarrow 2\text{NaOH}$ c. Any two physical properties of ionic compounds	1 1 1 2
30	a. Each Aluminium atom contains three electrons in its outermost shell. While each oxygen atom requires two more electrons to attain octet. Aluminium atom donates its electrons such that each atom attains octet as shown in the figure.  $\begin{array}{ccc} \text{Al} & \longrightarrow & \text{Al}^{3+} + 3\text{e}^- \\ (2,8,3) & & (2,8) \end{array}$ $\begin{array}{ccc} \text{O} + 2\text{e}^- & \longrightarrow & \text{O}^{2-} \\ (2,6) & & (2,8) \end{array}$	3



- b.
- i. a colourless and odourless gas is evolved along with salt.
  - ii. soluble salt is formed; heat is evolved
  - iii. No characteristic observation
  - iv. a colourless and odourless gas is evolved

31	X is carbon, Y is diamond as it is the hardest natural substance and Z is graphite as it is good conductor of electricity.	2
32	Iron, $3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$ .	2
33	Element A is a non-metal. Only non-metals form neutral and acidic oxides.	1
34	Calcium starts floating because the bubbles of hydrogen gas formed stick to the surface of metal. $\text{Ca} + 2\text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{H}_2$ Magnesium reacts with hot water and starts floating due to the bubbles of hydrogen gas sticking to its surface.	2
35	$2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$ X is Sodium, Y is Sodium Hydroxide and Z is $\text{H}_2$ .	2
36	The substance X is calcium oxide, $\text{CaO}$ . The element calcium is present in bones. On treatment with water, it produces calcium hydroxide as under: $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2$ Calcium hydroxide is a base. It turns red litmus blue.	3