

# **Maxprap. Chapter wise Series Class 10<sup>th</sup> - Chemistry**

**Class : 10<sup>th</sup>**

**Topic : Metals and Non Metals**

**Max. Marks : 50**

**Duration : 2 Hrs**

**Sections: A (MCQs), B (Short Answer-I), C (Short Answer-II), D (Long Answer), E (Case-Based).**

## **General Instructions:**

- (i). All questions are compulsory.
- (ii). This question paper contains 23 questions divided into five Sections A, B, C, D and E. (iii). Section A comprises of 10 MCQs of 1 mark each. Section B comprises of 5 questions of 2 marks each. Section C comprises of 4 questions of 3 marks each. Section D comprises of 2 question of 5 marks each and Section E comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.

## **Section A**

**Questions 1 to 10 carry 1 mark each**

1. Which of the following non - metals is a liquid?  
a) Carbon                      b) Phosphorus                      c) Bromine                      d) Sulphur
2. Copper utensils slowly lose their shiny brown surface and gain a green coat on prolonged exposure to atmospheric air. This is due to the formation of a coating of  
a) Copper sulphate                      b) Cupric oxide                      c) Cuprous oxide                      d) Copper carbonate
3. Reaction between X and Y, forms compound Z. X loses electron and Y gains electron. Which of the following properties is not shown by Z?  
a) Has high melting point                      b) Has low melting point  
c) Occurs as solid                      d) Conducts electricity in molten state
4. Aluminium foil is used for wrapping food because :  
a) it is a good conductor of heat                      b) it is sonorous  
c) it is ductile                      d) it is malleable
5. Dried fruit plastic bags sold in the market are filled with:  
a) All of these                      b) Hydrogen gas                      c) Nitrogen gas                      d) Helium gas
6. Copper is used for making cooking utensils. Which of the following physical properties of copper is NOT responsible for the same?  
a) High reactivity                      b) Malleability                      c) Thermal conductivity                      d) High melting point
7. Metal which is liquid at room temperature is :  
a) Sodium                      b) Lead                      c) Silver                      d) Mercury
8. The number of electrons in the outermost shell of the atom of a non - metal can be:  
a) 1, 2 or 3                      b) 5, 6 or 7                      c) 3, 4 or 5                      d) 5, 6 or 8

**Assertion(A)/Reason(R) Based (9-10):** In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- a) Both A and R are true and R is the correct explanation of A.
- b) Both A and R are true but R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.

9. **Assertion (A):** Sodium, calcium and magnesium are obtained by the electrolysis of their molten oxides.

**Reason (R):** These metals have more affinity for oxygen than carbon.

10. **Assertion (A):** The extraction of metals from their sulphide ores cannot take place without roasting of the ore.

**Reason (R):** Roasting converts sulphide ores directly into metals.

### SECTION – B

Questions 11 to 15 carry 2 marks each

11. During electrolytic refining of silver:

- a) What are the electrodes - cathode and anode made up of?
- b) What is anode mud? Why is it called so?

12. Name a metal of medium reactivity and write three main steps in the extraction of this metal from its sulphide ore.

13. A black metal oxide  $\text{XO}_2$  is used as a catalyst in the preparation of oxygen gas from potassium chlorate. The oxide  $\text{XO}_2$  is also used in ordinary dry cells. The metal oxide  $\text{XO}_2$  cannot be reduced satisfactorily with carbon to form metal X.

- a) Name the metal X.
- b) Name the metal oxide  $\text{XO}_2$
- c) Which reducing agent can be used to reduce  $\text{XO}_2$  to obtain metal X?
- d) Name another metal which can also be extracted by the reduction of its oxide with the above reducing agent.

14. What are the constituents of solder alloy? Which property of solder makes it suitable for welding electrical wires?

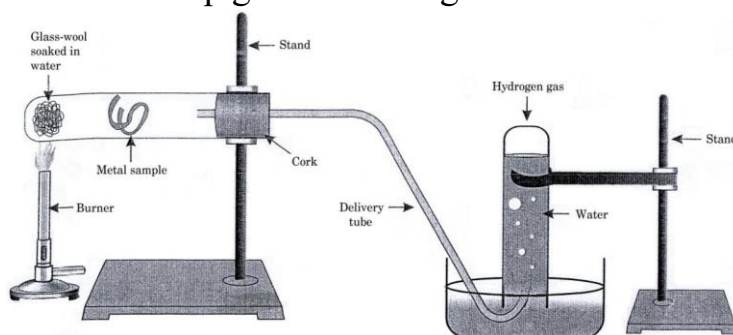
15.

- a) What is an ionic bond?
- b) How is an ionic bond formed?
- c) Write the formation of magnesium chloride.

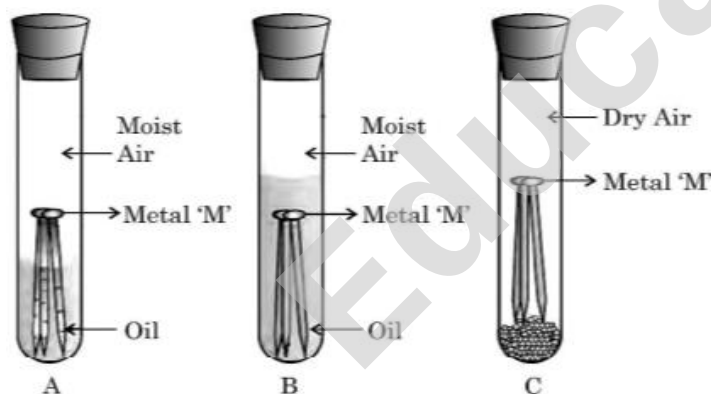
## SECTION – C

Questions 16 to 19 carry 3 marks each

16. Study the experimental set - up given in the figure and answer the following questions:



- Identify these metals from the following which can be used as "metal sample" in the given set - up:  
Aluminium, Copper, Iron, Lead, Silver
  - Write balanced chemical equations for the reaction in each case.
17. Observe the following diagram showing an experiment to determine the conditions under which a metal 'M' corrodes.



List your observations in each of the three cases A, B and C with reason, if the metal 'M' is generally protected against corrosion by the method of galvanisation.

18.

- Name two metals which react violently with cold water. List any three observations which a student notes when these metal are dropped in a beaker containing water.
  - Write a test to identify the gas evolved (if any) during the reaction of these metals with water.
19. The atomic number of an element is 20. Write its electronic configuration. State whether this element is a metal or a non - metal. What is its valency? Write the name and formula of the compound which this element forms with chlorine.

## SECTION – D

Questions 20 to 21 carry 5 marks each

20.

- Consider the following metals:  
K, Ca, Al, Cu, Ag, Fe  
Select from the above metals, a metal which

- i. does not react with oxygen even at high temperature.
  - ii. reacts with oxygen at ordinary temperature and forms a protective oxide layer which prevents the metal from further oxidation.
  - iii. catches fire when kept in the open.
  - iv. does not burn in oxygen but the hot metal is coated with a black coloured oxide layer.
- b) What are amphoteric oxides? With the help of balanced chemical equations show that aluminium oxide is an amphoteric oxide.
  - c) What are alkalis? Give one example.

21. In what forms are metals found in nature? With the help of examples, explain how metals react with oxygen, water and dilute acids. Also, write chemical equations for the reactions.

### SECTION – E (Case Study Based Questions)

Questions 22 & 23 carry 4 marks each

22. Read the following text carefully and answer the questions that follow:

Non - metals are either solids or gases. Non - metal can exist in different forms such as carbon. Each form is called allotrope. Alkali metal is so soft that it can be cut with a knife. They have low density and low melting point. Some metal can melt if they are kept in the palm.

- a) What are the physical properties of metals? (1)
- b) Differentiate between the physical properties of metals and non metals? (1)
- c) Give some exception of metals which does not obey the properties of metals?(2)

**OR**

Why is sodium always kept in kerosene oil? (2)

23. Read the following text carefully and answer the questions that follow:

Three metal samples of magnesium, aluminium and iron were taken and rubbed with sand paper. These samples were then put separately in test tubes containing dilute hydrochloric acid. Thermometers were also suspended in each test tube so that their bulbs dipped in the acid. The rate of formation of bubbles was observed. The above activity was repeated with dilute nitric acid and the observations were recorded.

Answer the following questions:

- a) When activity was done with dilute hydrochloric acid, then in which one of the test tubes was the rate of formation of bubbles the fastest and the thermometer showed the highest temperature? (1)
- b) Which metal did not react with dilute hydrochloric acid? Give reason. (1)
- c) Why is hydrogen gas not evolved when a metal reacts with dilute nitric acid? Name the ultimate products formed in the reaction. (2)

**OR**

Name the type of reaction on the basis of which reactivity of metals is decided. You have two metals X and Y. How would you decide which is more reactive than the other? (2)

| Metals and Non Metals Paper Details – Analysis |                           |  |
|------------------------------------------------|---------------------------|--|
| <b>Objective Questions</b>                     |                           |  |
| MCQ                                            | 1 marks x 8 question = 8  |  |
| Assertion Reason                               | 1 marks x 2 question = 2  |  |
| <b>Subjective</b>                              |                           |  |
| Short type I                                   | 2 marks x 5 question = 10 |  |
| Short type II                                  | 3 marks x 4 question = 12 |  |
| Long Type                                      | 5 marks x 2 question = 10 |  |
| <b>Case Studies Based</b>                      |                           |  |
| Case 1                                         | 4 marks                   |  |
| Case 2                                         | 4 marks                   |  |

Total = 50 marks      Your Score =