CLASS 10 CHEMISTRY PREVIOUS YEAR QUESTIONS
METALS AND NONMETALS

Question 1. Reverse of the following chemical reaction is not possible:
$Zn_{(s)} + CuSO_{4(aq)} \rightarrow ZnSO_{4(aq)} + Cu_{(s)}$
Justify this statement with reason. (Board Term I, 2016)

Question 2. Name a metal which:
(a) is the best conductor of heat.
(b) has a very low melting point.
(c) does not react with oxygen even at high temperature.
(d) is most ductile. (Board Term I, 2015)

Question 3. What is meant by amphoteric oxides? Choose the amphoteric oxides from the following : Na_2O, ZnO, CO_2, Al_2O_3, H_2O (Board Term I, 2014)

Question 4.Complete the following equation with balancing: (Board Term I, 2013)
(i) $Al + HCl \rightarrow$
(ii) $Mg + HNO_3 \rightarrow$

Question 5. Compare in tabular form the reactivities of the following metals with cold and hot water: (2020)
(a) Sodium (b) Calcium (c) Magnesium

Question 6. Give reason for the following:
(i) Hydrogen gas is not evolved when most of the metals react with nitric acid.
(ii) Zinc oxide is considered as an amphoteric oxide.
(iii) Metals conduct electricity. (Board Term I, 2016)

Question 7. (a) Why does calcium start floating when it reacts with water? Write the balanced chemical equation of the reaction.
(b) Name two metals which do not react with water. (Board Term I, 2015)

Question 8. State what would happen if:
(i) some zinc pieces are placed in blue copper sulphate solution.
(ii) some'copper pieces are placed in green ferrous sulphate solution.
(iii) an iron nail is dipped in a solution of copper sulphate for some time. (Board Term I, 2014)

Question 9. Give reason: (a) Aluminium is a reactive metal but is still used for packing food articles.
(b) Calcium starts floating when water is added to it. (Board Term I, 2014)

Question 10. (a) Complete and balance the following chemical equations:
(i) $Al_2O_3 + HCl \rightarrow$
(ii) $K_2O + H_2O \rightarrow$
(iii) $Fe + H_2O \rightarrow$
(b) An element 'X' displaces iron from the aqueous solution of iron sulphate. List your observations if the element 'X' is treated with the aqueous solutions of copper sulphate, zinc sulphate and silver nitrate. Based on the observations arrange X, Zn, Cu and Ag in increasing order of their reactivities. (2020)

Question 11. A metal 'X' combines with a non-metal 'Y' by the transfer of electrons to form a compound Z.
(i) State the type of bond in compound Z.
(ii) What can you say about the melting point and boiling point of compound Z?

(iii) Will this compound dissolve in kerosene or petrol?
(iv) Will this compound be a good conductor of electricity? (Board Term I, 2017)

Question 12. (i) By the transfer of electrons, illustrate the formation of bond in magnesium chloride and identify the ions present in this compound.
(ii) Ionic compounds are solids. Give reasons.
(iii) With the help of a labelled diagram show the experimental set up of action of steam on a metal. (2020)

Question 13. (a) (i) Write two properties of gold which make it the most suitable metal for ornaments.
(ii) Name two metals which are the best conductors of heat.
(iii) Name two metals which melt when you keep them on your palm.
(b) Explain the formation of ionic compound CaO with electron-dot structure. Atomic numbers of calcium and oxygen are 20 and 8 respectively. (2020)

Question 14. (i) Write down the electronic configuration
of magnesium and oxygen.
(ii) Give two general properties of the compound formed by combination of magnesium and oxygen.
(iii) Show the formation of this compound by the transfer of electrons. (Board Term 1,2014)

Question 15. An ore on treatment with dilute hydrochloric acid produces brisk effervescence. Name the type of ore with one example. What steps will be required to obtain metal from the enriched ore? Also write the chemical equations for the reactions involved in the process. (AI 2019)

Question 16. (i) Carbonate of metal '2T is abundant in earth crust and its hydroxide is used in 'white washing'. Identify metal 'XI
(ii) How will you convert this carbonate into its oxide? Name the process and write its equation. (Board Term I, 2014)

Question 17. Zinc is a metal found in the middle of the activity series of metals. In nature, it is found as a carbonate ore, $ZnCO_3$. Mention the steps carried out for its extraction from the ore. Support with equations. (Board Term 1,2013)

Question 18. Carbon cannot reduce the oxides of sodium, magnesium and aluminium to their respective metals. Why? Where are these metals placed in the reactivity series? How are these metals obtained form their ores? Take an example to explain the process of extraction along with chemical equations. (2020)

Question 19. Write balanced chemical equations to explain what happens, when
(i) Mercuric oxide is heated.
(ii) Mixture of cuprous oxide and cuprous sulphide is heated.
(iii) Aluminium is reacted with manganese dioxide.
(iv) Ferric oxide is reduced with aluminium.
(v) Zinc carbonate undergoes calcination. (2020)

Question 20. (a) List in tabular form three chemical properties on the basis of which we can differentiate between a metal and a non¬metal.
(b) Give reasons for the following :
(i) Most metals conduct electricity well.
(ii) The reaction of iron (III) oxide [Fe_2O_3] with heated aluminium is used to join cracked machine parts. (Delhi 2019)

Question 21. (a) Write the steps involved in the extraction of pure metals in the middle of the activity series from their carbonate ores.
(b) How is copper extracted from its sulphide ore? Explain the various steps supported by chemical

equations. Draw labelled diagram for the electrolytic refining of copper. (2018)

Question 22. Draw a schematic diagram of the various steps involved in the extraction of metals from ores for metals of medium reactivity and for metals of low reactivity. (Board Term I, 2018)

Question 23. (a) Describe an activity to show that metals are good conductors of electricity.
(b) Account for the following :
(i) Hydrogen gas is not evolved when a metal reacts with nitric acid.
(ii) For storing sodium metal, it is kept immersed in kerosene.
(iii) The reaction of iron (III) oxide with aluminium is used to join cracked iron parts of machines.
(Board Term I, 2016)

Question 24. How is copper obtained from its ore (Cu_2S)?
Write only the chemical equations. How is copper thus obtained refined? Name and explain the process along with a labelled diagram. (Board Term I, 2015)

Question 25. (a) Copper produced by heating the ore in air is not very pure. Describe the method used for refining impure copper. Draw labelled diagram of the process.
(b) Write chemical equations for the reactions taking place when :
(i) zinc sulphide is heated in air.
(ii) zinc carbonate is calcined. (Board Term I, 2014)

Question 26. Assertion (A) : The metals and alloys are good conductors of electricity.
Reason (R) : Bronze is an alloy of copper and tin and it is not a good conductor of electricity.
(a) Both (A) and (R) are true and (R) is the correct explanation of the assertion (A).
(b) Both (A) and (R) are true, but (R) is not the correct explanation of the assertion (A).
(c) (A) is true, but (R) is false.
(d) (A) is false, but (R) is true.

Question 27. Name first discovered alloy. Give its composition also. (Board Term I, 2014)

Question 28. List three differentiating features between the processes of galvanisation and alloying.

Question 29. Describe an activity to find out the conditions under which iron rusts. (Board Term I, 2017)

Question 30. Why some metal surfaces acquire a dull appearance when they are exposed to moist air? Write colour acquired by the surfaces of copper and silver in such situation and also write the chemical names of the substances due to which it happens. (Board Term I, 2016)

Question 31. (a) Name the following :
(i) Metal that can be cut by knife
(ii) Lustrous non-metal
(iii) Metal that exists in liquid state at room temperature
(iv) Most malleable and ductile metal
(v) Metal that is best conductor of electricity
(vi) Non-metal that can exist in different forms
(b) How are alloys better than metals? Give composition of solder and amalgam.

Question 32. (a) Define corrosion.
(b) What is corrosion of iron called?
(c) How will you recognise the corrosion of silver?
(d) Why corrosion of iron is a serious problem?
(e) How can we prevent corrosion of iron? (Board Term I, 2017)

Question 33. Give reason for the following :
(a) Ionic compounds have higher melting point and higher boiling point.
(b) Sodium is kept immersed in kerosene.
(c) Reaction of calcium with water is less violent.
(d) Silver articles become black after some time when exposed to air.
(e) Prior to reduction the metal sulphides and carbonates must be converted into metal oxides for extracting metals. (Board Term I, 2015)

Question 34. (a) Metals like iron, silver and copper get corroded on exposure to air. Write the chemical name of the substance deposited on their surface respectively with it's colour, in each case.
(b) List four ways by which rusting can be prevented. (Board Term I, 2013)

Short Answer Type Questions[I] [2 Marks]-Year 2015

35.Write one example of each of
(i) a metal which is so soft that, it can be cut with knife and a non-metal which is the hardest sustance.
(ii) a metal and a non-metal which exist as liquid at room temperature.

36.Mention the names of the metals for the following:
(i) Two metals which are alloyed with iron to make stainless steel.
(ii) Two metals which are used to make jewellary.

Short Answer Type Question[I] [2 Marks] -Year 2013

37.Give reason for the following:
(a) School bells are made up of metals.
(b) Electric wires are made up of copper.

Short Answer Type Question[II] [3 Marks] -Year 2013

38. Suggest a method of reduction for the following metals during their metallurgical processes:
(i) metal 'A' which is one of the last, second or third position in the reactivity.
(ii) metal 'B' which gives vigorous reaction even with water and air.
(iii) metal 'C' which is kept in the middle df activity series.

Very Short Answer Type Question [1 Mark] -Year 2012

39.A green layer is gradually formed on a copper plate left exposed to air for a week in a bathroom. What could this green substance be?

Short Answer Type Questions[I] [2 Marks] -Year 2012

40.Name the following:
(a) A metal, which is preserved in kerosene.
(b) A lustrous coloured non-metal.
(c) A metal, which can melt while kept on palm.
(d) A metal, which is a poor conductor of heat.

41. Give reason for the following:
(a) Aluminium oxide is considered as an amphoteric oxide.
(b) Ionic compounds conduct electricity in molten state.

Short Answer Type Questions[ll] [3 Marks] -Year 2012

42. A metal 'X' acquires a green colour coating on its surface on exposure to air.
(i) Identify the metal 'X' and name the process responsible for this change.
(ii)Name and write chemical formula of the green coating formed on the metal.
(iii) List two important methods to prevent the process.

43.What are amphoteric oxides? Choose the amphoteric oxides from amongst the following oxides: Na_2O, ZnO, Al_2O_3, CO_2, H_2O

44.Define the terms: (i) mineral (ii) ore, and (iii) gangue.

Long Answer Type Questions [5 Marks] -Year 2012

45. (a) Write the chemical name of the coating that forms on silver and copper articles when these are left exposed to moist air.
(b) Explain what is galvanisation. What purpose is served by it?
(c) Define an alloy. How are alloys prepared? How do the properties of iron change when:
(i) small quantity of carbon,
(ii) nickel and chromium are mixed with it.

46.(a) Carbon cannot be used as reducing agent to obtain Mg from MgO. Why?
(b) How is sodium obtained from molten sodium chloride? Give equation of the reactions.
(c) How is copper obtained from its sulphide ore? Give equations of the reactions.

47.Give reasons for the following:
(i) Silver and copper lose their shine when they are exposed to air. Name the substance formed on their surface in each case.
(ii) Tarnished copper vessels are cleaned with tamarind juice.
(iii) Aluminium is more reactive than iron yet there is less corrosion of aluminium as compared to iron when both are exposed to air.

48. What are alloys? How are they made? Name the constituents and uses of brass, bronze and solder.

Very Short Answer Type Questions [1 Mark] -Year 2011

49. 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.

50. Why does calcium float in water?

51.Name a non-metal which is lustrous and a metal which is non-lustrous. Iodine is a non-metal which is lustrous,

52.Which gas is liberated when a metal reacts with an acid? How will you test the presence of this gas?

53.Name the metal which reacts with a very dilute HNOs to evolve hydrogen gas.

54.Name two metals which are found in nature in the free state.

Answer Type Questions[I] [2 Marks] -Year 2011

55.The way, metals like sodium, magnesium and iron react with air and water is an indication of their relative positions in the 'reactivity series'. Is this statement true ? Justify your answer with examples.

56. $X + YSO_4$ ——-> $XSO_4 + Y$
$Y + XSO_4$ ———> No reaction
Out of the two elements, 'X' and 'Y', which is more reactive and why?

57.What is an alloy? State the constituents of solder. Which property of solder makes it suitable for welding electrical wires?

58. Write chemical equations that shows aluminium oxide reacts with acid as well as base.
Answer.

$$Al_2O_3 + 6HCl \longrightarrow 2AlCl_3 + 3H_2O$$

$$Al_2O_3 + 2NaOH \longrightarrow 2NaAlO_2 + H_2O$$

Long Answer Type Questions [5 Marks] -Year 2011

59.(a) How can the metals at the top of the reactivity series be extracted from their ores? Explain with an example.
(b) Name any one alloy made from
(i) a metal and a non-metal, and
(ii) two metals.

Very Short Answer Type Questions [1 Mark] -Year 2010

60.What is the valency of silicon with atomic number 14?

61.What is the valency of phosphorus with atomic number 15?

62.What is the valency of an element with atomic number 35?

Short Answer Type Question[I] [2 Marks] -Year 2010

63.Elements magnesium and oxygen respectively belong to group 2 and group 16 of the Modern Periodic Table. If the atomic numbers of magnesium and oxygen are 12 and 8 respectively, draw their electronic configurations and show the process of formation of their compound by transfer of electrons.

Very Short Answer Type Question [1 Mark] -Year 2009

64. Arrange the following metals in the decreasing order of reactivity: Na, K, Cu, Ag.

Short Answer Type Questions[ll] [3 Marks] -Year 2009

65. Give reasons for the following observations:
(i) Ionic compounds in general have high melting and boiling points.
(ii) Highly reactive metals cannot be obtained from their oxides by heating them with carbon.
(iii) Copper vessels get a green coat when left exposed to air in the rainy season.

66. State reasons for the following observations:
(i) The shining surface of some metals becomes dull when exposed to air for a long time.
(ii) Zinc fails to evolve hydrogen gas on reacting with dilute nitric acid.
(iii) Metal sulphides occur mainly in rocks but metal halides occur mostly in sea and lake waters.

67. State reasons for the following:
(i) Electric wires are covered with rubber like material.
(ii)From dilute hydrochloric acid, zinc can liberate hydrogen gas but copper cannot.
(iii) Sulphide ore of a metal is first converted to its oxide to extract the metal from it.

Long Answer Type Questions [5 Marks] -Year 2009

68.(a) What is meant by corrosion? Name any two methods used for the prevention of corrosion.
(b) Suppose you have to extract metal M from its enriched sulphide ore. If M is in the middle of the reactivity series, write various steps used in extracting this metal.