PRACTICE EXERCISE 3.1

Q1. Name one metal andone non-metal which exist in liquid state at room temperature.

Q2. Why are metals called electropositive elements whereas non-metals are called electronegative elements?

Q3. Name the most abundant metal in the earth's crust.

Q4. Name the most abundant non-metal in the earth's crust.

Q5. Name one metal which has a low melting point.

Q6. Name the metal which is the poorest conductor of heat.

Q7. State whether the following statement is true or false:

Non-metals react with dilute acids to produce a gas which burns with a 'pop' sound.

Q8. From amongst the metals sodium, calcium, aluminium, copper and magnesium, name the metal;

(i) which reacts with water only on boiling, and

(ii) another which does not react even with steam.

Q9. What changes inthe colour of iron nails and copper sulphate solution do you observe after keeping the iron nails dipped in copper sulphate solution for about 30 minutes?

Q10. What is aqua-regia? Name two special metals which are insoluble in common reagents but dissolve in aqua-regia.

Q11. Give the names and formulae of (a) two acidic oxides, and (b) two basic oxides.

Q12. What name is given to those metal oxides which show basic as well as acidic behaviour?

Q13. Name two metals which form amphoteric oxides.

Q14. A copper coin is kept immersed in a solution of silver nitrate for some time. What will happen to the coin and the colour of the solution?

Q15. Which porperty of copper and aluminium makes them suitable:

(a) for making cooking utensils and boilers?

(b) for making electric wires?

Q16. Write the name and formulae of (a) a metal hydride, and (b) a non-metal hydride.

Q17. Name the metal which has been placed:

(a) at the bottom of the reactivity series.

(b) at the top of the reactivity series.

(c) just below copper in the reactivity series.

Q18. Which of the two metals is more reactive : copper or silver?

Q19. Name one metal which is stored in kerosene oil.

Q20. Name one non-metal which is stored under water.

Q21. Write equation for the reaction of:

(a) sodium with oxygen

(b) magnesium with oxygen

Q22. Name two metals which are used for making electric wires.

Q23. Name two metals which are used for making domestic utensils and factory equipment.

Q24. Name two metals which are used for making jewellery and to decorate sweets.

Q25. Which metal foil is used for packing some of the medicine tables?

Q26. Name the non-metal which is used to convert vegetable oil into vegetable ghee (solid fat).

Q27. Name the non-metal which is used as a rocket fuel (in liquid form).

Q28. Name the non-metal which is used to make electrodes of dry cells.

Q29. Name the non-metal which is used to preserve food materials.

Q30. Name the non-metal which is used in the vulcanisation of rubber.

Q31. Name one property which is characteristic of (a) metals, and (b) non-metals.

Q32. What is meant by "brittleness"? Which type of elements usually show brittleness: metals or non-metals?

Q33. What happens when iron nails are put into copper sulphate solution?

PRACTICE EXERCISE 3.2

Q1. What will happen if a strip of zinc is immersed in a solution of copper sulphate?

Q2. What iwll hapen if a strip of copper is kept immersed in a solution of silver nitrate ($AgNO_3$)?

Q3. How would you show that silver is chemically less reactive than copper?

Q4. Give reasons for the following:
Blue colour of copper sulphate solution is destroyed when iron fillings are added to it.

Q5. Name a non-metal having a very high melting point.

Q6. Which property of graphite is utilised in making electrodes?

Q7. Name two non-metals which are both brittle and non-ductile.

Q8. Explain why, the surface of some metals acquires a dull appearance when exposed to air for a long time.

Q9. What is meant by saying that the metals are malleable and ductile? Explain with examples.

Q10. Name two metals which are both malleable and ductile.

Q11. Which property of iron metal is utilised in producing iron sheets required for making buckets?

Q12. Which property of copper metal is utilised in making thin wires?

Q13. Name two metals which react violently with cold water. Write any three observations you would make when such a metal is dropped into water. How would you identify the gas evolved, if any, during the reaction?

Q14. Which the help of examples, describe how metal oxides differ from non-metal oxides.

Q15. Which of the following elements would yield: (i) an acidic oxide, (ii) a basic oxide, and (iii) a neutral oxide? Na, S, C, K, H

Q16. What are amphoteric oxides? Give two examples of amphoteric oxides.

Q17. Choose the acidic oxides, basic oxides and neutral oxides from the following:
Na_2O; CO_2; CO; SO_2; MgO; N_2O; H_2O.

Q18. Which of the following are amphoteric oxides:
MgO, ZnO, P_2O_3, $Al2O_3$, NO_2

Q19. What is the nature of the oxide SO_2? What happens when it is dissolved in water? Write the chemical equation of the reaction involved.

Q20. What is the nature of the oxide Na_2O? What happens when it is dissolved in water? Write the chemical equation of the reaction involved.

Q21. What type of oxides are formed when non metals react with oxygen? Explain with an example.

Q22. What type of oxides are formed when metals combine with oxygen? Explain with the help of an example.

Q23. Explain why, metals usually do not liberate hydrogen gas with dilute nitric acid.

Q24. Name two metals which can, however, liberate hydrogen gas form very dilute nitric acid.

Q25. How do metals react with hydrogen? Explain with an example.

Q26. How do non-metals react with hydrogen? Explain with an example.

Q27. What happens when calcium reacts with chlorine? Write an equation for the reaction which takes place.

Q28. What happens when magnesium reacts with very dilute nitric acid? Write an equation for the reaction involved.

Q29. Arrange the following metals in order of their chemical reactivity, placing the most reactive metal first:
Magnesium, Copper, Iron, Sodium, Zinc, Lead, Calcium.

Q30. What happens when a rod of zinc metal is dipped into a solution of copper sulphate? Give chemical equation of the reaction involved.

Q31. A copper plate was dipped in $AgNO_3$ solution. After ceertain time, silver from the solution was deposited on the copper plate. State the reason why it happened. Give the chemical equation of the reaction involved.

Q32. State five uses of metals and five of non-metals.

PRACTICE EXERCISE 3.3

Q1. State one use each of the following metals: Copper, Aluminium, Iron, Silver, Gold, Mercury

Q2. State one use each of the following non metals: Hydrogen, Carbon (as Graphite), Nitrogen, Sulphur

Q3. Name the metal which is used in making thermometers.

Q4. Why does aluminium not react with water under ordinary conditions?

Q5. Name two metals which can displace hydrogen from dilute acids.

Q6. Name two metals which cannot displace hydrogen from dilute acids.

Q7. Why is sodium kept immersed in kerosene oil?

Q8. Why is white phosphorus kept immersed under water?

Q9. Can we keep sodium immersed under water? Why?

Q10. Describe the reaction of pottasium with water. Write the equation of the reaction involved.

Q11. Write an equation of the reaction of iron with steam. Indicate the physical states of all the reactants and products.

Q12. Which gas is produced when dilute hydrochloric acid is added to a reactive metal?

Q13. Give one example, with equation, of the displacement of hydrogen by a metal from an acid.

Q14. Name two metals (other than zinc and iron) which can displace hydrogen from dilute hydrochloric acid?

Q15. What is the action of water on (a) sodium (b) magnesium, and (c) aluminium? Write equations of the chemical reactions involved.

Q16. You are given samples of three metals - sodium, magnesium and coper. Suggest any two activities to arrange them in order of their decreasing reactivities.

Q17. Write one reaction in which aluminium oxide behaves as a basic oxide and another in which it behaves as an acidic oxide.

Q18. What special name is given to substances like aluminium oxide.

Q19. Name another metal oxide which behaves like aluminium oxide.

Q20. What happens when calcium reacts with water? Write the chemical equation of the reaction of calcium with water.

Q21. Write the chemical equation of the reaction which takes place when iron reacts with dilute sulphuric acid. What happens when the gas produced in ignited with a burning matchstick?

Q22. You are given a dry cell, a torch bulb with holder, wires and crocodile clips. How would you use them to distinguish between samples of metals and non-metals?

Q23. State any five physical properties of metals and five physical properties of non-metals.

Q24. Name two physical properties each of sodium and carbon in which their behaviour is not as expected from their classification as metal and non-metal respectively.

Q25. Name two metals whose melting points are so low that they melth when held in the hand.

Q26. Metals are said to be shiny. Why do metals generally appear to be dull? How can their brightness be restored?

Q27. What are metals? name five metals.

Q28. Name a metal which is so soft that it can be cut with a knife.

Q29. Name the metal which is the best conductor of heat and electricity.

Q30. What happens when a metal reacts with dilute hydrochloric acid? Explain with the help of an example.

Q31. Write the equations for the reactions of magnesium with dilute hydrochloric acid.

Q32. Write the equations for the reactions of aluminium with dilute hydrochloric acid

Q33. Write the equations for the reactions of zinc with dilute hydrochloric acid.

Q34. Write the equations for the reactions of iron with dilute hydrochloric acid.

PRACTICE EXERCISE – 3.4

Q1. Define non-metals. Give five examples of non-metals.

Q2. Name a non-metal which conducts electricity.

Q3. Name a non-metal having lustre (shiring surface).

Q4. Name a non-metal which is extremely hard.

Q5. How do non-metals react with oxygen? Explain with an example. Give equation of the reaction involved. What is the nature of the product fromed? How will you demonstrate it?

Q6. State and explain the reactions, if any, of the following metals with a solution of copper sulphate:

(a) Gold (b) Copper

(c) Zinc (d) Mercury

Q7. Give the names and formulae of one metal chloride and one non-metal chloride.

Q8. State an important property in which these metal chloride and non-metal chloride differ.

Q9. In a solution of lead acetate, a strip of metal M was dipped. After some tune, lead from the solution was deposited on the metal strip. Which metal is more reactive, M or lead?

Q10. $CuSO_4 + Fe \longrightarrow FeSO_4 + Cu$

$FeSO_4 + Zn \longrightarrow ZnSO_4 + Fe$

On the basis of the above reactions, indicate which is most reactive and which is least reactive metal out of zinc, copper and iron.

Q11. Which of the following reactions will not occur? Why not?

$MgSO_4 + Cu \longrightarrow CuSO_4 + Mg$

$CuSO_4 + Fe \longrightarrow FeSO_4 + Cu$

$MgSO_4 + Fe \longrightarrow FeSO_4 + Mg$

Q12. In nature, metal A is found in a free state while metal B is found in the form of its compounds. Which of these two will be nearer to the top of the activity series of metals?

Q13. If A, B, C, D, E, F, G, H, I, J and K represent metals in the decreasing order of their reactivity, which one of them is most likely to occur in a free state in nature?

Q14. Name a metal for each case:

It does not react with cold as well as hot water but reacts with steam.

Q15. Name a metal for each case:

It does not react with any physical state of water.

Q16. Name a metal for each case:

When calcium metal is added to water, the gas evolved does not catch fire but the same gas evolved on adding sodium metal to water catches fire. Why is it so?

Q17. A zinc plate was kept in a glass container having $CuSO_4$ solution. On examining it was found that the blue colour of the solution is getting lighter and lighter. After a few days, when the zinc plate was taken out of the solution, a number of small holes were noticed in it. State the reason and give chemical equation of the reaction involved.

Q18. Define non-metals. Give five examples of non-metals.

Q19. Name a non-metal which conducts electricity.

Q20. Name a non-metal having lustre (shining surface).

Q21. Name a non-metal which is extremely hard.

Q22. How do non-metals react with oxygen? Explain with an example. Give equation of the reaction involved. What is the nature of the product fromed? How will you demonstrate it?

Q23. What is meant by the reactivity series of metals? Arrange the following metals in an increasing order of their reactivities towards water: Zinc, Iron, Magnesium, Sodium

Q24. Hydorgen is not a metal but still it has been assigned a place in the reactivity series of metals. Why?

Q25. Name one metal more reactive and another less reactive than hydrogen.

Q26. Name one metal which displaces copper from copper sulphate solution and one which does not.

PRACTICE EXERCISE – 3.5 (M.C.Q.)

Q1. The elements whose oxides can turn phenophthalein solution pink are:
(a) Na and K (b) K and C
(c) Na and S (d) K and P

Q2. "Is malleable and ductile". This best describes:
(a) a metal (b) a compound
(c) a non-metal (d) a solution

Q3. One of the following is not a neutral oxide. This is:
(a) CO (b) H_2O
(c) N_2O (d) Na_2O

Q4. A basic oxide will be formed by the element:
(a) K (b) S
(c) P (d) Kr

Q5. An acidic oxide is produced by the element:
(a) Na (b) C
(c) Ca (d) H

Q6. You are given a solution of $AgNO_3$. Which of the following do you think cannot displace Ag from $AgNO_3$ solution?
(a) Magnesium (b) Zinc
(c) Gold (d) Copper

Q7. Out of aluminium copper, calcium and tin, the most reactive metals is:
(a) aluminium (b) copper
(c) tin (d) calcium

Q8. The least reactive metal among the following is:
(a) sodium (b) silver
(c) copper (d) lead

Q9. An element X reacts with hydrogen, when heated, to form a covalent hydride H_2X. If H_2X has a smell of rotten eggs, the element X is likely to be:
(a) carbon (b) sulphur
(c) chlorine (d) phosphorus

Q10. Out of the following oxides, the amphoteric oxide is:
(a) Fe_2O_3 (b) Al_2O_3
(c) P_2O_3 (d) N_2O

Q11. The metals which can produce amphoteric oxides are:
(a) sodium and aluminium
(b) zinc and potassium
(c) calcium and sodium
(d) aluminium and zinc

Q12. An element X forms two oxides XO and XO_2. The oxide XO is neutral but XO_2 is acidic in nature. The element X is most likely to be:
(a) sulphur (b) carbon
(c) calcium (d) hydrogen

Q13. The elements whose oxides can turn litmus solution blue are:
(a) carbon and sulphur
(b) sodium and carbon
(c) potassium and magnesium
(d) magnesium and sulphur

Q14. The elements whose oxides can turn litmus solution red are:
(a) lithium and sodium
(b) copper and potassium
(c) carbon and hydrogen
(d) phosphorus and sulphur

Q15. Zinc oxide is a metal oxide. Which of the following term best describes the nature of zinc oxide:
(a) an acidic oxide
(b) a basic oxide
(c) an amphoteric oxide
(d) a neutral oxide

Q16. A metal less reactive and another metal more reactive than hydrogen are:
(a) aluminium and lead
(b) iron and magnesium
(c) copper and tin
(d) copper and mercury

Q17. An element E reacts with water to form a solution which turns phenophthalein solution pink. The element E is most likely to be:
(a) S (b) Ca
(c) C (d) Ag

Q18. An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water. The element is likely to be:
(a) calcium (b) carbon
(c) silicon (d) iron

PRACTICE EXERCISE – 3.6

Q1. What is the name of the chemical bond formed by the sharing of electrons between two atoms?

Q2. What is the name of the chemical bond formed by the transfer of electrons from one atom to another?

Q3. What type of chemical bonds is formed between:
(a) potassium and bromine?
(b) carbon and bromine?

Q4. What do we call those particles which have more more or less electrons that the normal atoms?

Q5. What do we call those particles which have more electrons than the normal atoms?

Q6. What do we call those particles which have less electrons than the normal atoms?

Q7. What is an ionic bond? What type of bond is present in oxygen molecule?

Q8. What is an ion? Explain with examples.

Q9. What is the nature of charge on (i) a cation, and (ii) an anion?

Q10. Name the cation and anion present in $MgCl_2$. Also write their symbols.

Q11. What type of chemical bond is present in chlorine molecule? Explain your answer.

Q12. Explain the formation of a chlorine molecule on the basis of electronic theory of valency.

Q13. Giving one example each, state what are (i) ionic compounds, and (ii) covalent compounds.

Q14. Compare the properties of ionic compounds and covalent compounds.

Q15. Explain why ionic compounds have generally high melting points.

Q16. Give two general properties of ionic compounds and two those of covalent compounds.

Q17. State one test by which sodium chloride can be distinguished from sugar.

Q18. Write down the electronic configuration of (i) sodium atom, and (ii) chlorine atom.

Q19. How many electrons are there in the outermost shell of (i) a sodium atom, and (ii) a chlorine atom?

Q20. Show the formation of NaCl from sodium and chlorine atoms by the transfer of electron(s).

Q21. Why has sodium chloride a high melting point?

Q22. Name the anode and the cathode used in the electrolytic refining of impure copper metal.

Q23. Write the electron arrangement in (i) a magnesium atom, and (ii) an oxygen atom.

Q24. How many electrons are there in the valence shell of (i) a magnesium atom, and (ii) an oxygen atom?

Q25. Show on a diagram the transfer of electrons between the atoms in the formation of MgO?

Q26. Name the solvent in which ionic compounds are generally soluble.

Q27. Why are aqueous solutions of ionic compounds able to conduct electricity?

Q28. What is the electronic configuration of (i) a sodium atom, and (ii) an oxygen atom?

Q29. What is the number of outermost electrons in (i) a sodium atom, and (ii) an oxygen atom?

Q30. Show the formation of Na_2O by the transfer of electrons between the combining atoms.

Q31. Why are ionic compounds usually hard?

Q32. How is it that ionic compounds in the solid state do not conduct electricity but they do so when in molten state?

Q33. Two non-metals combine with each other by the sharing of electrons to form a compound X.
(a) What type of chemical bond is present in X?
(b) State whether X will have a high melting point or low melting point.
(c) Will it be a good conductor of electricity or not?
(d) Will it dissolve in an organic solvent or not?

Q34. A metal combines with a non-metal by the transfer of electrons to form a compound Y.
(i) State the type of bonds in Y.
(ii) What can you say about its melting point and boiling point?
(iii) Will it be a good conductor of electricity?

PRACTICE EXERCISE – 3.7

Q1. The electronic configurations of three elements X, Y and Z are as follows:

X	2, 4
Y	2, 7
Z	2, 1

(a) Which two elements will combine to form an ionic compound?

(b) Which two elements will react to form a covalent compound?

Give reasons for your choice.

Q2. The atomic number of sodium is 11. What is the number of electrons in $Na^{+?}$

Q3. The atomic number of chlorine is 17. What is the number of electrons in $Cl^{-?}$

Q4. The atomic number of an element X is 8 and that of element Y is 12. Write down the symbols of the ions you would expect to be formed from their atoms.

Q5. Write down the electronic configuration of (i) magnesium atom, and (ii) magnesium ion. (At. No. of Mg = 12)

Q6. Write down the electronic configuration of (i) sulphur atom, and (ii) sulphide ioin. (At. No. of S = 16)

Q7. What type of chemical bonds are present in a solid compound which has a high melting point, does not conduct electricity in the solid state but becomes a good conductor in the molten state?

Q8. Explain why, ionic compounds conduct electricity in solution whereas covalent compounds do not conduct electricity.

Q9. Which of the following will conduct electricity and which not?

$MgCl_2$, CCl_4, NaCl, CS_2, Na_2S

Give reasons for your choice

Q10. Name one ionic compound containing chlorine and one covalent compound containing chlorine.

Q11. How will you find out which of the water soluble compound A or B is ionic?

Q12. The solution of one of the following compounds will not conduct electricity. This compound is:

(a) NaCl (b) CCl_4 (c) $MgCl_2$ (d) $CaCl_2$

Q13. The electronic configuration of threee elements X, Y and Z are:

X: 2 Y: 2, 8, 7

Z: 2, 8, 2

Which of the following is correct regarding these elements?

(a) X is a metal (b)Y is a metal

(c) Z is a non-metal

(d) Y is a non-metal and Z is a metal

Q14. Which one of the following property is generally no exhibited by ionic compounds?

(a) solubility in water

(b) electrical conductivity in solid state

(c) high melting and boiling points

(d) electrical conductivity in molten state

Q15. An element A has 4 valence electrons in its atom whereas element B has only one valence electron in its atom. The compound formed by A and B does not conduct electricity. What is the nature of chemical bond in the compound formed? Give its electron-dot structure.

Q16. In the formation of a compound XY_2 atom X gives one electron to each Y atom. What is the nature of bond in XY_2? Give two properties of XY_2 .

Q17. An element 'A' has two electrons in the outermost shell of its atom and combines with an element 'B' having seven electrons in the outermost shell, forming the compound AB_2 . The compound when dissolved in water conducts electric current. Giving reasons, state the nature of chemical bond in the compound.

Q18. What type of bonds are present in hydrogen chloride and oxygen?

Q19. Write the electron-dot structures for the following molecules: (i) NaCl (ii) Cl_2

Q20. What type of bonds are present in water molecule? Draw the electron-dot structure of water (H_2O).

Q21. What type of bonds are present in methane (CH_4) and sodium chloride (NaCl)?

PRACTICE EXERCISE – 3.8

Q1. State one major difference between covalent and ionic bonds and give one example each of covalent and ionic compounds.

Q2. What type of bonds are present in the following molecules? Draw their electron-dot strucutres.

(i) H_2 (ii)CH_4

(iii) Cl_2 (iv) O_2

Q3. Which inert gas electron configuration do the Cl atoms in Cl_2 molecule resemble? What is this electron configuration?

Q4. Which of the following compounds are ionic and which are covalent?

Urea, Cane sugar, Hydrogen chloride, Sodium chloride, Ammonium chloride, Carbon tetrachloride, Ammonia, Alcohol, Magnesium chloride.

Q5. Fill in the blanks in the following sentences:

(i) Two atoms of the same element combine to form a molecule. The bond between them is known as.....bond.

(ii) Two chlorine atoms combine to form a molecule. The bond between them is known as .....

(iii) In forming oxygen molecule, ... electrons are shared by each atom of oxygen.

(iv) In forming N_2 molecule,..... electrons are shared by each atom of nitrogen.

(v) The number of single covalent bonds in C_2H_2 molecule are .....

(vi) Melting points and boiling points of ionic compounds are generally ..... than those of covalent compounds.

Q6. Explain why, a solution of cane sugar does not conduct electricity but a solution of common salt is a good conductor or electricity.

Q7. What are noble gases? What is the characteristic of the electronic configuration of noble gases?

Q8. What is the cause of chemical bonding (or chemical combination) of atoms of elements?

Q9. Write electron-dot structures for magnesium and oxygen.

Q10. Show the formation of MgO by the transfer of electrons. What are the ions present in this compound?

Q11. Draw the electron-dot structure of a hydrogen chloride molecule:

(i) Which inert gas does the H atom in HCl resemble in electron arrangement?

(ii) Which inert gas does the Cl atom in HCl resemble in electron arrangement?

Q12. What type of bonding would you expect between the following pairs of elements?

(i) Calcium and Oxygen

(ii) Carbon and Chlorine

(iii) Hydrogen and Chlorine

Q13. Element X reacts with element Y to form a compound Z. During the formation of compound Z, atoms of X lose one electron each whereas atoms of Y gain one electron each. Which of the following property is not shown by compound Z?

(a) high melting point

(b) low melting point

(c) occurrence as solid

(d) conduction of electricity in molten state

Q14. The electronic configurations of two elements A and B are given below:

A	2, 6
B	2, 8, 1

(a) What type of chemical bond is formed between the two atoms of A?

(b) What type of chemical bond will be formed between the atoms of A and B?

Q15. Four elements A, B, C and D have the following electron arrangements in their atoms:

A	2, 8, 6
B	2, 8, 8
C	2, 8, 8, 1
D	2, 7

(a) What type of bond is formed when element C combines with element D?

(b) Which element is an inert gas?

(c) What will be the formula of the compound between A and C?

PRACTICE EXERCISE – 3.9

Q1. Describe how sodium and chlorine atoms are changed into ions when they react with each other to form sodium chloride, NaCl,. What is the name given to this type of bonding? (At. No of sodium = 11; At No. of chlorine = 17).

Q2. What is the difference between a cation and an anion? How are they formed? Give the names and symbols of one cation and one anion.

Q3. Using electron-dot diagrmas which show only the outermost shell electrons, show how a molecule of nitrogen, N_2, is formed from two nitrogen atoms. What name is given to this type of bonding? (Atomic number of nitrogen is 7)

Q4. Draw the electron-dot structures of the following compounds and state the type of bonding in each case:

(i) MgO (ii)$MgCl_2$

Q5. Using electron-dot diagrams which show only the outermost shell electrons, show how a molecule of oxygen, O_2, is formed from two oxygen atoms. What name is given to this type of bonding? (At. No. of oxygen = 8)

Q6. Draw the electron-dot structures of the following compounds and state the type of bonding in each case:

(i) KCl (ii) CaO (iii) $CaCl_2$

Q7. Explain why, a salt which does not conduct electricity in the solid state becomes a gold conductor in molten state.

Q8. One of the following contains a double bond as well as single bonds. This is:

(a) CO_2 (b) O_2

(c) C_2H_4 (d) C_2H_2

Q10. The electronic configurations of four particles A, B, C and D are given below:

A	2, 8, 8
B	2, 8, 2
C	2, 6
D	2, 8

Which electronic configuration represents:

(i) magnesium atom?(ii) oxygen atom?

(iii) sodium ion? (iv) chloride ion?

Q11. The atomic number of an element X is 12.

(a) What must an atom of X do to attain the nearest inert gas electron configuration.

(b) Which inert gas is nearest to X?

Q12. The atomic number of an element Y is 16.

(a) What must an atom of Y do to achieve the nearest inert gas electron arrangement?

(b) Which inert gas is nearest to Y?

Q13. You can buy solid air-freshners in shops. Do you think these substances are ionic or covalent? Why?

Q14. Give the formulae of the chlorides of the elements X and Y having atomic numbers of 3 and 6 respectively. Will the properties of the two chlorides be similar or different? Explain your answer.

Q15. An element X of atomic number 12 combines with an element Y of atomiic number 17 to form a compound XY_2. State the nature of chemical bond in XY_2 and show how the electron configurations of X and Y change in the formation of this compound.

Q16. The electronic configurations of three elements A, B and C are as follows:

A	2, 8, 1
B	2, 8, 7
C	2, 4

(a) Which of these elements is a metal?

(b) Which of these elements are non-metals?

(c) Which two elements will combine to form an ionic bond?

(d) Which two elements will combine to form a covalent bond?

(e) Which element will form an anion of valency 1?

Q15. Particle X nd Y gain / loss their electrons from their valence shell to attain the configuration of nearest noble gas. If the atomic numbers of X and Y are 4 and 16, respectively, how will the particles lose / gain electrons and name the noble gases formed

PRACTICE EXERCISE – 3.10

Q1. The atomic number of an element X is 19. The number of electrons in its ion X^+ will be:

(a) 18 (b) 19

(c) 20 (d) 21 **Ans.**(a)

Q2. The atomic number of an element Y is 17. The number of electrons in its ion Y^- will be:

(a) 17 (b) 18

(c) 19 (d) 20 **Ans.**(b)

Q3. The atomic numbers of four elements A, B, C and D are 6, 8, 10 and 12 respectively. The two elements which can react to form ionic bonds (or ionic compound) are:

(a) A and D (b) B and C

(c) A and C (d) B and D **Ans.**(d)

Q4. The atomic number of four elements P, Q, R and S are 6, 10, 12 and 17 respectively. Which two elements can combine to form a covalent compound?

(a) P and R (b) Q and S

(c) P and S (d) R and S **Ans.**(c)

Q5. The solution of one of the following compounds will not conduct electricity. This compound is:

(a) NaCl (b) CCl_4

(c) $MgCl_2$ (d) $CaCl_2$ **Ans.**(b)

Q6. The electronic configuraitons of three elements X, Y and Z are:

(a) X is a metal (b) Y is a metal

(c) Z is a non-metal **Ans.**(d)

(d) Y is a non-metal and Z is a metal

Q7. Which one of the followng property is generally not exhibited by ionic compounds?

(a) solubility in water

(b) electrical conductivity in solid state

(c) high melting and boiling points

(d) electrical conductivity in solid state **Ans.**(b)

Q8. The electrons present in the valence shell of a noble gas atom can be:

(a) 8 only (b) 2 only

(c) 8 or 2 (d) 8 or 4 **Ans.**(c)

Q9. The atomic number of an element X is 16. The symbol of ion formed by an atom of this element will be:

(a) X^{2+} (b) X^{3+}

(c) X^{2-} (d) X^- **Ans.**(c)

Q10. The number of protons in the nucleus of one atom of an element Y is 5. The symbol of ion formed by an atom of this element will be:

(a) Y^{3-} (b) Y^{2+}

(c) Y^{2-} (d) Y^{3+} **Ans.**(d)

Q11. Out of KCl, HCl, CCl_4 and NaCl, the compounds which are not ionic are:

(a) KCl and HCl

(b) HCl and CCl_4

(c) CCl_4 and NaCl

(d) KCl and CCl_4 **Ans.**(b)

Q12. Element X reacts with element Y to form a compound Z. During the formation of compound Z, atoms of X lose one electron each whereas atoms of Y gain one electron each. Which of the following property is not shown by compound Z?

(a) hight melting point

(b) low melting point

(c) occurence as solid **Ans.**(b)

(d) conduction of electricity in molten state

Q13. One of the following compounds is not ionic in nature. This compound is:

(a) Lithium chloride

(b) Ammonium chloride

(c) Calcium chloride

(d) Carbon tetrachloride **Ans.**(d)

PRACTICE EXERCISE – 3.11

Q1. A zinc ore gave CO_2 on treatment with a dilute acid. Identify the ore and write its chemical formula.

Q2. What chemical process is used for obtaining a metal from its oxide?

Q3. State two ways to prevent the rusting of iron.

Q4. What is meant by galvanisation? Why is it done?

Q5. Name the metal which is used for galvanishing iron.

Q6. Explain why, iron sheets are coated with zinc.

Q7. Why do we apply paint on iron articles?

Q8. Give reason for the following:
Carbonate and sulphide ores are usually coverted into oxides during the process of extraction of metals.

Q9. Name a reducing agent that may be used to obtain manganese from manganese dioxide.

Q10. Name an alloy of lead and tin.

Q11. How is manganese extracted from manganese extracted from manganese dioxide, MnO_2? Explain with the help of an equation.

Q12. What is a thermite reaction? Explain with the help of an equation. State one use of this reaction.

Q13. Which one of the methods given in column I is applied for the extraction of each of the metals given in column II:

Column I	Column II
Electrolytic reduction	Aluminium
Reduction with Carbon	Zinc
Reduction with Aluminium	Sodium
	Iron
	Manganese
	Tin

Q14. Give reason why copper is used to make hot water tanks but steel (an alloy of iron) is not.

Q15. Explain why, the surface of some metals aquires a dull appearance when exposed to air for a long time.

Q16. Why does aluminium not corrode right through?

Q17. What is meant by 'anodising'? Why is it done?

Q18. Why is an iron grill painted frequently?

Q19. Explain why, though aluminium is more reactive than iron, yet there is less corrosion of aluminium when both are exposed to air.

Q20. Name the method by which aluminium metal is extracted.

Q21. Give the name and chemical formula of one ore of copper.

Q22. How is zinc extracted from its carbonate ore (calamine)? Explain with equations.

Q23. Name two metals which occur in nature in free state as well as in combined state.

Q24. Name one ore of manganese. Which compound of manganese is present in this ore? Also write in chemical formula.

Q25. A zinc ore on heating in air forms sulphur dioxide. Describe briefly any two stages involved in the reactivity conversion of this concentrated ore into zinc metal.

Q26. How does the method used for extracting a metal from its ore depend on the metal's position in the reactivity series? Explain with examples.

Q27. What is the difference between a mineral and an ore?

Q28. Which metal is extracted from cinnabar ore?

Q29. Name one ore of sodium. Name the sodium compound present in this ore and write its chemical formula.

Q30. How is sodium metal extracted? Explain with the help of equation of the reaction involved.

Q31. Name three other metals which are extracted in a manner similar to sodium.

Q32. Give the composition of an alloy called solder. State its one property and one use.

Q33. What is an amalgam?

Q34. How many carats is pure gold? Why is pure gold not suitable for making ornaments?

Q35. Name one method for the refining of metals.

Q36. State two conditions for the rusting of iron.

Q37. Explain giving one example, how highly reactive metals (which are high up in the reactivity series) are extracted.

PRACTICE EXERCISE – 3.12 (MCQ)

Q1. An ore of manganese metal is:
(a) bauxite (b) haematite
(c) cuprite (d) pyrolusite

Q2. Which of the following is an iron ore?
(a) cinnabar (b) calamine
(c) haematite (d) rock salt

Q3. The metal which can be extracted from the bauxite ore is:
(a) Na (b) Mn
(c) Al (d) Hg

Q4. The two metals which can be extracted just by heating their sulphides in air are:
(a) sodium and copper
(b) copper and aluminium
(c) potassium and zinc
(d) mercury and copper

Q5. A common metal which is highly resistant to corrosion is:
(a) iron (b) copper
(c) aluminium (d) magnesium

Q6. An important ore of zinc metal is:
(a) calamine (b) cuprite
(c) bauxite (d) pyrolusite

Q7. The major ore of aluminium is known as:
(a) cinnabar (b) calamine
(c) bauxite (d) pyrolusite

Q8. The two metals which are extracted by means of electrolytic reduction of their molten salts are:
(a) magnesium and manganese
(b) iron and aluminium
(c) zinc and magnesium
(d) magnesium and aluminium

Q9. In stainless steel alloy, iron metal is mixed with:
(a) Cu and Cr (b) Cr and Ni
(c) Cr and Sn (d) Cu nd Ni

Q10. If copper is kept exposed to damp air for a considerable time, it gets a green coating on its surface. This is due to the formation of:
(a) hydrated copper sulphate
(b) copper oxide
(c) basic copper carbonate
(d) copper nitrate

Q11. Which of the following alloys contains mercury as one of the constituents?
(a) stainless steel
(b) solder (c) duralumin
(d) zinc amalgam

Q12. Which of the following is an ore of mercury metal?
(a) rock salt (b) cinnabar
(c) calamine (d) haematite

Q13. Calamine ore can be used to extract one of the following metals. This metal is:
(a) copper (b) mercury
(c) aluminium (d) zinc

Q14. Which of the following pair of metals exists in their native state in nature?
(a) Ag and Hg (b) Ag and Zn
(c) Au and Hg (d) Au and Ag

Q15. Which of the following alloys contains a non - metal as one of the constituents?
(a) Brass (b) Amalgam
(c) Steel (d) Bronze

Q16. During the refining of an impure metal by electrolysis, the pure metal is deposited:
(a) at cathode (b) at anode
(b) on the walls of electrolytic tank
(d) at the bottom of the electrolytic tank

Q17. Which of the following metals can be obtained from haematite ore?
(a) copper (b) sodium
(c) zinc (d) iron

Q18. Brass is an alloy of:
(a) Cu and Sn (b) Cu and Pb
(c) Pb and Sn (d) Zn and Cu

Q19. The metal which is always present in amalgam is:
(a) iron (b) aluminium
(c) mercury (d) magnesium

Q20. During galvanisation, iron metal is given a thin coating of one of the following metals. This metal is:
(a) chromium (b) tin
(c) zinc (d) copper

PRACTICE EXERCISE – 3.13

Q1. An element A which is a part of common salt and kept under kerosene reacts with another element B of atomic number 17 to give a product C. When an aqueous solution of product C is electrolysed then a compound D is formed and two gases are liberated.

(a) What are A and B?

(b) Identify C and D.

(c) What will be the action of C on litmus solution? Why?

(d) State whether element B is a solid, liquid or gas at room temperature.

(e) Write formula of the compound formed when element B reacts with an element E having atomic number 5.

Q2. A metal which exists as a liquid at room temperature is obtained by heating its sulphide ore in the presence of air.

(a) Name the metal and write its chemical symbol.

(b) Write the name and formula of the sulphide ore.

(c) Give the equations of chemical reactions involved in the production of metal from its sulphide ore.

(d) Name a common device in which this metal is used.

(e) Can this metal displace copper from copper sulphate solution? Why?

Q3. No chemical reaction takes place when granules of a rusty-brown 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.

(a) What could the solids A and B be?

(b) What are the products C and D most likely to be?

(c) Write the chemical equation for the reaction between A and B leading to the formation of C and D. Mention the physical states of all the reactants and products in this equation and indicate the heat change which takes place.

(d) What is the special name of such a reaction ? State one use of such a reaction.

(e) Name any two types of chemical reactions under which the above reaction can be classified.

Q4. In an electrolytic tank, aluminium metal is being extracted by the electrolysis of molten aluminium oxide using carbon electrodes. It is observed that one of the carbon electrodes is gradually burnt away and has to be replaced.

(a) Which carbon electrode (cathode or anode) is burnt away?

(b) Why is this carbon electrode burnt away?

Q5. A metal X which is resistant to corrosion is produced by the electrolysis of its molten oxide whereas another metal Y which is also resistant to corrosion is produced by the reduction of its oxide with carbon. Metal X can be used in powder form in thermite welding whereas metal Y is used in making cathodes of ordinary dry cells.

(a) Name the metals X and Y.

(b) Which of the two metals is more reactive: X or Y?

(c) Name one ore or metal X. Also write its chemical formula.

(d) Name one ore of metal Y. Also write its chemical formula.

(e) Name one alloy of metal X and one alloy of metal Y.

Q6. Four metals P, Q, R and S are all obtained by the reduction of their oxides with carbon. Metal P is used to form a thin layer over the sheets of metal S to prevent its corrosion. Metal Q is used for electroplating tiffin boxes made of metal S whereas metal R is used in making car batteries. Metals Q and R form an alloy called solder. What are metals P, Q, R and S? How have you arrived at this conclusion?