RAVI MATHS TUITION CENTER , WHATSAPP - 8056206308

Metals And Non-Metals MCQ TEST

10th Standard

Science

62 x 1 = 62

1) Which of the following pairs will give displacement reactions?

(a) NaCl solution and copper metal (b) $MgCl_2$ solution and aluminium metal (c) $FeSO_4$ solution and silver metal

(d) $AgNO_3$ solution and copper metal

2) Which of the following methods is suitable for preventing an iron frying pan from rusting?

(a) Applying grease (b) Applying paint (c) Applying a coating of zinc (d) All of the above

3) An element reacts with oxygen to give a compound with a high melting point. This compound is also suitable in water. The element is likely to be

(a) Calcium (b) Carbon (c) Silicon (d) Iron

4) Food cans are coated with tin and not with zinc because

(a) Zinc is costlier than tin (b) Zinc has a higher melting point than tin (c) Zinc is more reactive than tin

(d) Zinc is less reactive than tin

5) Which of the following properly is generally not shown by metals?

(a) Electrical conduction (b) Sonorous in nature (c) Dullness (d) Ductility

6) The ability of metals to be drawn into thin wire is known as

(a) Ductility (b) mallleability (c) Sonorousity (d) conductivity

7) Which of the following oxide(s) of iron would be obtained on prolonged reaction of iron with steam?

(a) FeO (b) Fe_2O_3 (c) Fe_3O_4 (d) Fe_2O_3 and Fe_3O_4

8) Aluminium is used for making cooking utensils. Which of the following properties of aluminium are responsible for the same? (i) Good thermal conductivity (ii) Good electrical conductivity (iii) Ductility (iv) High melting point

(a) (i) and (ii) (b) (i) and (iii) (c) (ii) and (iii) (d) (i) and (iv)

9) Which one of the following metals do not react with cold as well as hot water?

(a) Na (b) Ca (c) Mg (d) Fe

10) What happens when calcium is treated with water? (i) It does not react with water. (ii) It reacts violently with water. (iii) It reacts less violently with water. (iv) Bubbles of hydrogen gas formed stick to the surface of calcium.

(a) (i) and (iv) (b) (ii) and (iii) (c) (i) and (ii) (d) (iii) and (iv)

11) Generally metals react with acids to give salt and hydrogen gas. Which of the following acids does not give hydrogen gas on reacting with metals (except Mn and Mg)?

(a) H_2SO_4 (b) HCl (c) HNO_3 (d) All of these

12) The composition of aqua-regia is

(a) Dil.HCl : Conc.HNO_3 [3 : 1] (b) Conc.HCl : Dil.HNO_3 [3 : 1] (c) Conc.HCl : Conc.HNO_3 [3 : 1] (d) Dil.HCl : Dil.HNO_3 [3 : 1]

13) Which of the following are not ionic compounds ?
(i) KCl (ii) HCl (iii) CCl_4 (iv) NaCl

(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iii)

14) Which one of the following properties is not generally 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

15) Which of the following metals exist in their native state in nature?
(i) Cu (ii) Au (iii) Zn (iv) Ag

(a) (i) and (ii) (b) (ii) and (iii) (c) (ii) and (iv) (d) (iii) and (iv)

16) Metals are refined by using different methods. Which of the following metals are refined by electrolytic refining?
(i) Au (ii) Cu (iii) Na (iv) K

(a) (i) and (ii) (b) (i) and (iii) (c) (ii) and (iii) (d) (iii) and (iv)

17) Silver articles become black on prolonged exposure to air. This is due to the formation of

(a) Ag_3N (b) Ag_2O (c) Ag_2S (d) Ag_2S and Ag_3N

18) Galvanisation is a method of protecting iron from rusting by coating with a thin layer of

(a) Gallium (b) Aluminium (c) Zinc (d) Silver

19) Stainless steel is very useful material for our life. In stainless steel, iron is mixed with

(a) Ni and Cr (b) Cu and Cr (c) Ni and Cu (d) Cu and Au

20) If copper is kept open in air, it slowly loses its shining brown surface and gains a green coating. It is due to the formation of

(a) $CuSO_4$ (b) $CuCO_3$ (c) $Cu(NO_3)_2$ (d) CuO

21) Generally, metals are solid in nature. Which one of the following metals is found in liquid state at room temperature?

(a) Na (b) Fe (c) Cr (d) Hg

22) Which of the following metals are obtained by electrolysis of their chlorides in molten state? (i) Na (ii) Ca (iii) Fe (iv) Cu

(a) (i) and (iv) (b) (iii) and (iv) (c) (i) and (iii) (d) (i) and (ii)

23) Generally, non-metals are not lustrous. Which of the following nonmetal is lustrous?

(a) Sulphur (b) Oxygen (c) Nitrogen (d) Iodine

24) Which one of the following four metals would be displaced from the solution of its salts by other three metals?

(a) Mg (b) Ag (c) Zn (d) Cu

25) 2 ml each of concentrated HCl, HNO_3 and a mixture of concentrated HCl and concentrated HNO_3 in the ratio of 3 : 1 were taken in test tubes labelled as A, B and C. A small piece of metal was put in each test tube. No change occured in test tubes A and B but the metal got dissolved in test tube C respectively. The metal could be

(a) Al (b) Au (c) Cu (d) Zn

26) An alloy is

(a) An element (b) A compound (c) A homogeneous mixture (d) A heterogeneous mixture

27) An electrolytic cell consists of (i) Positively charged cathode (ii) Negatively charged anode (iii) Positively charged anode (iv) Negatively charged cathode

(a) (i) and (ii) (b) (iii) and (iv) (c) (i) and (iii) (d) (ii) and (iv)

28) During electrolytic refining of zinc, it gets

(a) Deposited on cathode (b) Deposited on anode (c) Deposited on cathode as well as anode (d) Remains in the solution

29) An element A is soft and can be cut with a knife. This is very reactive to air and cannot be kept open in air. It reacts vigorously with water. Identify the element from the following

(a) Mg (b) Na (c) P (d) Ca

30) Alloys are homogeneous mixtures of a metal with a metal or nonmetal. Which among the following alloys contain non-metal as one of its constituents?

(a) Brass (b) Bronze (c) Amalgam (d) Steel

31) Which among the following statements is incorrect for magnesium metal?

(a) It burns in oxygen with a dazzling white flame. (b) It reacts with cold water to form magnesium oxide and evolves hydrogen gas

(c) It reacts with hot water to form magnesium hydroxide and evolves hydrogen gas.

(d) It reacts with steam to form magnesium hydroxide and evolves hydrogen gas.

32) Which among the following alloys contain mercury as one of its constituents?

(a) Stainless steel (b) Alnico (c) Solder (d) Zinc amalgam

33) 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) Conducts electricity in molten state (d) Occurs as solid

34) The electronic configurations of three elements X, Y and Z are X - 2, 8; Y - 2, 8, 7 and Z - 2, 8, 2. Which of the following is correct?

(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

35) Although metals form basic oxides, which of the following metals form an amphoteric oxide?

(a) Na (b) Ca (c) Al (d) Cu

36) Generally, non-metals are not conductors of electricity. Which of the following is a good conductor of electricity?

(a) Diamond (b) Graphite (c) Sulphur (d) Fullerene

37) Electrical wires have a coating of an insulating material. The material, generally used is

(a) Sulphur (b) Graphite (c) PVC (d) All can be used

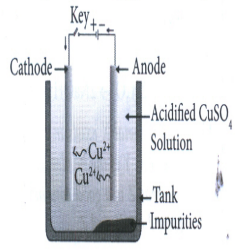
38) Which of the following non-metals is a liquid?

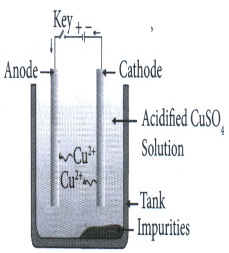
(a) Carbon (b) Bromine (c) Phosphorus (d) Sulphur

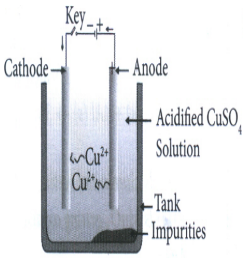
39) Which of the following can undergo a chemical reaction?

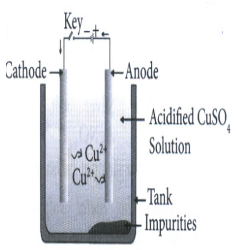
(a) $MgSO_4$ + Fe (b) $ZnSO_4$ + Fe (c) $MgSO_4$ + Pb (d) $CuSO_4$ + Fe

40) Which one of the following figures correctly describes the process of electrolytic refining?

(a) 

(b) 

(c) 

(d) 

41) Which of the following metals is present in the anode mud during the electrolytic refining of copper?

(a) Sodium (b) Aluminium (c) Gold (d) Iron

42) When iron fillings are heated in a stream of dry hydrogen chloride the compound formed is $FeCl_x$ where X is

(a) 1 (b) 2 (c) 3 (d) 4

43) The second most abundant metal in the earth's crust is

(a) oxygen (b) silicon (c) aluminium (d) iron

44) An alloy of Zn and Cu is dissolved in dil. HCl. Hydrogen gas is evolved. In this evolution of gas

(a) only zinc reacts with dil. HCl (b) only copper reacts with dil. HCl (c) both zinc and copper react with dil. HCl

(d) only copper reacts with water

45) A greenish coating develops on copper utensils due to formation of

(a) $CuCO_3$ (b) $Cu(OH)_2$ (c) $Cu(OH)_2.CuCO_3$ (d) CuO

46) Rusting of iron takes place in

(a) ordinary water (b) distilled water (c) both ordinary and' distilled water (d) none of the above

47) Bronze is an alloy

(a) Cu and Zn (b) Zn and Ni (c) Cu and Sn (d) Cu, Zn, Tn

48) During smelting, an additional substance is added which combines with impurities to form a fusible product known as

(a) slag (b) mud (c) gangue (d) flux

49) A student placed an iron nail in copper sulphate solution. He observed the reddish brown coating on the iron nail which is

(a) soft and dull (b) hard and flading (c) smooth and shining (d) rough and granular

50) Which among the following alloys contain non-metal as one of its constituents

(a) Brass (b) Amalgam (c) Gun metal (d) None of thes

51) An aluminium strip is kept immersed in freshly prepared ferrous sulphate solution taken in a test tube, the change observed is that

(a) Green solution slowly turns brown (b) Lower end of test tube become slightly warm

(c) A colourless gas with the smell of burning sulphur is observed (d) Light green solution changes to blue.

52) Which of the following will not evolve CO_2 upon heating?

(a) $CaCO_3$ (b) $MgCO_3$ (c) $ZnCO_3$ (d) Na_2CO_3

53) Which of the following are not ionic compounds?

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

54) 5 mL each of cone. HCl, HNO_3 and a mixture of cone. HCl (15 mL) and cone. HNO_3 (5 mL) were taken in test tubes labelled as A, Band C. A small piece of metal was put in each tube. No change occurred in test tube A and B but the metal got dissolved in test tube C. The metal could be

(a) AI (b) Au (c) Cu (d) Na

55) The electronic configuration of three element X, Y and Z are
X - 2,8
Y - 2, 8, 6
Z - 2, 8, 1
Which of the following is correct?

(a) X is a metal (b) Z is a non-metal (c) Y is a metal (d) X and Yare non-metal and Z is a metal

56) The process of coating of Zn over Fe is known as

(a) Cathodic protection (b) Metallurgy (c) Tinning (d) Galvanization

57) The method used for reduction of mercuric oxide to mercury is

(a) Heating (b) Chemical reduction (c) Calcination (d) Electrolytic reduction

58) $Cu + 2Ag(NO_3)_2 \longrightarrow CU(NO_3)_2 + 2Ag$
$Pb + CU(NO_3)_2 \longrightarrow Pb(NO_3)_2 + Cu$
$Zn + Pb(NO_3)_2 \longrightarrow Zn(NO_3)_2 + Pb$
The most reactive metal is

(a) Ag (b) Pb (c) Cu (d) Zn

59) Which of the following oxides, on reduction with carbon gives metal ?

(a) Al_2O_3 (b) ZnO (c) MgO (d) All of these

60) Magnesium dissolves in hot water to form

(a) MgO (b) $Mg(OH)_2$ (c) MgOH (d) $MgO.Mg(OH)_2$

61) Identify an ore containing sulphur in it

(a) Siderite (b) Fluorspar (c) Iron pyrites (d) Calamine

62) Arrange the following metals in the order of their decreasing reactivity: Fe, Cu, Mg, Ca, Zn,Ag

(a) Ca > Zn > Mg > Cu > Ag > Fe (b) Ca > Zn > Cu > Mg > Ag > Fe (c) Ca > Mg > Zn > Fe > Cu > Ag

(d) Ca > Mg > Fe > Zn > Cu > Ag

30 x 1 = 30

63) **Assertion**: A wire of about 2 km length can be drawn from one gram of gold.
Reason: The ability of metals to be drawn into thin wires is called ductility.
Codes
(a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false.

64) **Assertion**: Iron does not bum on heating
Reason: Iron filings bum vigorously when sprinkled in the flame of the burner.
Codes
(a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false.

65) **Assertion**: Anodising is a process of forming a thick oxide layer of aluminium.
Reason: This aluminium oxide coat makes it resistant to further corrosion.
Codes
(a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false.

66) **Assertion**: Hydrogen gas is evolved when a metal reacts with nitric acid.
Reason: All acids release hydrogen gas when reacted with metals.
Codes
(a) If both assertion and reason are true and the reason is correct explanation of assertion.
(b) If both assertion and reason are true but reason is not a correct explanation of assertion.
(c) If assertion is true and reason is false.
(d) If both assertion and reason are false.

67) **Assertion**: Metals do not displace hydrogen gas when reacted with bases

Reason: There are few metals like copper that can displace hydrogen from base.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.

(b) If both assertion and reason are true but reason is not a correct explanation of assertion.

(c) If assertion is true and reason is false.

(d) If both assertion and reason are false.

68) **Assertion**: Silver articles become black after sometime when exposed to air

Reason: It reacts with nitrogen in the air to form a coating of silver nitride.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.

(b) If both assertion and reason are true but reason is not a correct explanation of assertion.

(c) If assertion is true and reason is false.

(d) If both assertion and reason are false.

69) **Assertion**: Alloy is made by mixing a metal with either other metal or non metal

Reason: It is prepared by first melting the primary metal and then dissolving the other elements in it in definite proportions.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.

(b) If both assertion and reason are true but reason is not a correct explanation of assertion.

(c) If assertion is true and reason is false.

(d) If both assertion and reason are false.

70) **Assertion**: Lead is less reactive than copper.

Reason: Copper can displace zinc from its solution.

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.

(b) If both assertion and reason are true but reason is not a correct explanation of assertion.

(c) If assertion is true and reason is false.

(d) If both assertion and reason are false.

71) **Assertion**: Silver is better conductor than copper

Reason: Resistivity of copper is slightly higher than silver

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.

(b) If both assertion and reason are true but reason is not a correct explanation of assertion.

(c) If assertion is true and reason is false.

(d) If both assertion and reason are false.

72) **Assertion**: Metals are malleable

Reason: They can be easily hammered into thin sheets

Codes

(a) If both assertion and reason are true and the reason is correct explanation of assertion.

(b) If both assertion and reason are true but reason is not a correct explanation of assertion.

(c) If assertion is true and reason is false.

(d) If both assertion and reason are false.

73) **Assertion:** Different metals have different reactivities with water and dilute acids.

Reason: Reactivity of a metal depends on its position in the reactivity series.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

74) **Assertion:** Iron is the most widely used metal. But it is never used in its pure state.
Reason: Pure iron is very soft and stretches easily when hot.
Codes
(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

75) **Assertion:** Gold occurs in native state.
Reason: Gold is a reactive metal.
Codes
(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

76) **Assertion:** The property of beating a metal into sheets is called ductility.
Reason: Gold and silver are most malleable metals.
Codes
(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

77) **Assertion:** Silver and gold do not react with oxygen even at high temperatures.
Reason: Silver and gold are less active metals.
Codes
(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

78) **Assertion:** The oxides of sulphur and phosphorus are acidic in nature.
Reason: Metal oxides are basic in nature.
Codes
(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

79) **Assertion:** Bromine cannot displace chlorine from its salt solution.
Reason: Chlorine is more reactive than bromine.
Codes
(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

80) **Assertion:** MgO exists in liquid state.
Reason: The electrostatic forces of attraction between Mg^{2+} and 0 2^{-} ions constitute ionic bond.
Codes
(a) Both A and R are true, and R is correct explanation of the assertion.
(b) Both A and R are true, but R is not the correct explanation of the assertion.
(c) A is true, but R is false.
(d) A is false, but R is true.

81) **Assertion:** On reacting with water, calcium starts floating over water.

Reason: Calcium reacts with cold water at room temperature.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

82) **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.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

83) **Assertion:** Non-metals are electronegative in nature.

Reason: They have tendency to lose electrons.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

84) **Assertion:** Ionic compounds have high melting and boiling points.

Reason: A large amount of energy is required to break the strong inter-ionic attraction in ionic compounds

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

85) **Assertion:** Metals in general have very high melting and boiling points.

Reason: Metals have the strongest chemical bonds which are metallic in nature.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

86) **Assertion:** Electrovalency of Na is +1.

Reason: The number of electrons which an atom either loses or gains in the formation of an ionic bond is known as its valency.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

87) **Assertion:** Metals generally act as reducing agents.

Reason: The reducing character is expressed in terms of electron releasing tendency.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

88) **Assertion:** Magnesium reacts with oxygen upon heating and burns brightly to form magnesium oxide.

Reason: Magnesium oxide is basic in nature.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

89) **Assertion:** The reaction of calcium with water is less violent in comparison to that of sodium.

Reason: The heat evolved is not sufficient for the hydrogen to catch fire.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

90) **Assertion:** C and N do not react with dil. HCI and dil. H_2 SO_4.

Reason: Metals do not react with dil. HCI and dil. H_2 SO_4.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

91) **Assertion:** Copper displaces silver from silver nitrate solution.

Reason: Copper is more reactive than silver.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

92) **Assertion:** Aluminum oxide and zinc oxide are acidic in nature.

Reason: Amphoteric nature means that substance have both acidic and basic character.

Codes

(a) Both A and R are true, and R is correct explanation of the assertion.

(b) Both A and R are true, but R is not the correct explanation of the assertion.

(c) A is true, but R is false.

(d) A is false, but R is true.

11 x 4 = 44

93) The chemical reactivity of an element depends upon its electronic configuration. All elements having less than eight electrons in the outermost shell show chemical reactivity. During chemical reactions, atoms of all elements tend to achieve a completely filled valence shell. Metals are electropositive in nature. They have tendency to lose one or more electrons present in the valence shell of their atoms to form cations and achieve nearest noble gas configuration. The compounds formed by the transfer of electrons from one element to other are known as ionic or electrovalent compounds.

(i) The electronic configurations of three 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)Yis a non-metal and Z is a metal**

(ii) 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 properties is not shown by compound Z?

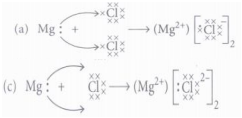
(a) High melting point

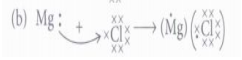
(b) Low melting point

(c) Occurrence as solid

(d) Conduction of electricity in molten state

(iii) Which of the following is correct representation of formation of magnesium chloride?





(d) None of these

(iv) The electronic configuration of sodium ion is

(a) 2,8,8 **(b) 2,8,2.** **(c) 2,6** **(d) 2,8.**

(v)Which of the following represents an electropositive element?

(a) 2,8,6 **(b) 2,8,8** **(c) 2,8,8,1** **(d) 2, 7**

94) The arrangement of metals in a vertical column in the decreasing order of their reactivities is called the reactivity series or activity series of metals. The most reactive metal is at the top position of the reactivity series. The least reactive metal is at the bottom of the reactivity series.

Hydrogen, though a non-metal, has been included in the activity series of metals only for comparison. Apart from it, the hydrogen atom also has tendency to lose its valence electron and form cation which behaves like metal.

$\mathrm{H} \rightarrow \mathrm{H}^{+} + e^{-}$

(i) Which metal can be displaced by copper from its salt solution?

(a) Zinc **(b) Silver** **(c) Iron** **(d) Lead**

(ii) An element 'X after reacting with acids liberates hydrogen gas and can displace lead and mercury from their salt solutions. The metal 'X is

(a) copper **(b) gold** **(c) calcium** **(d) hydrogen.**

(iii) the most reactive metal is

(a) potassium **(b) barium** **(c) zinc** **(d) calcium**

(iv) The metal which does not liberate hydrogen gas after reacting with acid is

(a) zinc **(b) lead** **(c) iron** **(d) gold**

(v) Which of the following metals does not react with water at all?

(I) Sodium

(II) Copper

(III) Aluminium

(IV) Lead

(a) I and III only **(b) IV only** **(c) II and IV only** **(d) I, II, III and IV**

95) Metals as we know, are very useful in all fields, industries in particular. Non-metals are no less in any way. Oxygen present in air is essential for breathing as well as for combustion. Non-metals form a large number of compounds which are extremely useful, e.g., ammonia, nitric acid, sulphuric acid, etc.

Non-metals are found to exist in three states of matter. Only solid non-metals are expected to be hard however, they have low density and are brittle. They usually have low melting and boiling points and are poor conductors of electricity.

(i)_____ is a non-metal but is lustrous

(a) Phosphorus (b) Sulphur (c) Bromine (d) Iodine

(ii) Which of the following is known as 'King of chemicals'?

(a) Urea (b) Ammonia X (c) Sulphuric acid (d) Nitric acid

(iii) Which of the following non-metals is a liquid?

(a) Carbon (b) Bromine (c) Iodine (d) Sulphur

(iv) Hydrogen is used

(a) for the synthesis of ammonia (b) for the synthesis of methyl alcohol

(c) in welding torches (d) all of these

(v) Generally, non-metals are bad conductors of electricity but 'X'which is a form of carbon is a good conductor of electricity and is an exceptional non-metal. 'X'is

(a) diamond (b) graphite (c) coal (d) coke.

96) Ionic compound is a chemical compound in which ions are held together by ionic bonds. An ionic bond is the type of chemical bond in which two oppositely charged ions are held through electrostatic forces. We know that, metal atoms have loosely bound valence electrons in their valence shell and non-metal atoms need electrons in their valence shell to attain noble gas configuration. The metal atom loses the valence electrons while non-metal atom accepts these electrons. By losing electrons, metal atoms change to cations and by accepting electrons, non-metals form anions. Ionic compounds are generally solid and exist in the form of crystal. They have high melting and boiling points.

(i) Which of the following can change to a cation?

(a) Fluorine (b) Oxygen (c) Potassium (d) Neon

(ii) Which of the following can change to an anion?

(a) Iodine (b) Magnesium (c) Calcium (d) Xenon

(iii) Ionic compounds are soluble in _____.

(a) Kerosene (b) Petrol (c) Water (d) None of these

(iv) Which of the following statements is correct about ionic compounds?

I. They conduct electricity in solid state.

II. They conduct electricity in solutions.

III. They conduct electricity in molten state.

(a) I only (b) II only (c) III only (d) II and III only

(v) Select the incorrect statement.

(a) Ionic compounds are generally brittle

(b) Ions are the fundamental units of ionic compounds

(c) Formation of ionic bonds involve sharing of electrons

(d) NaCl is an ionic compound.

97) An element is a pure substance made up of same kind of atoms. At present, nearly 118 elements are known but all of them do not occur free in nature, some of them have been synthesized by artificial methods. Based on their properties, they are mainly classified as metals and non-metals. Metals are those elements which lose electrons and form positive ions i.e., they are electropositive in nature. They are generally hard, good conductors of heat and electricity, malleable, ductile and have striking lustre. They have a significant role to play in our daily life.

(i) Metals which are of vital importance to the national defence, energy and industry sector are called strategic metals. Which of the following is a strategic metal?

(a) Titanium (b) Zirconium (c) Manganese (d) All of these

(ii) Which metal is the best conductor of electricity?

(a) Silver (b) Platinum (c) Nickel (d) Iron

(iii) Which of the following metals is not a coinage metal?

(a) Copper (b) Silver (c) Iron (d) Gold

(iv) Which of the following are the most malleable metals?

(I) Sodium

(II) Gold

(III) Potassium

(IV) Silver

(a) (I) and (IV) (b) (II) and (III) (c) (III) and (IV) (d) (II) and (IV)

Identify the correct statement(s).

(I) The wires that carry current in our homes have a coating of PVC or a rubber like material.

(II) School bells are made of metals.

(III) Metals do not conduct electricity.

(IV) Metals which produce a sound on striking a hard surface are said to be non-sonorous.

(a) (I) and (III) (b) (I) and (II) (c) (III) and (IV) (d) Only (II)

98) The chemical properties of metals are mostly linked with the electron releasing tendency of their atoms. Greater the tendency, more will be the reactivity of the metal. They react with oxygen, water, hydrogen, acids, etc. Since they can lose electrons, they act as reducing agents. Some reactions of metals are given as :

Metal + Oxygen $\longrightarrow$ Metal oxide

Metal + Water $\longrightarrow$7 Metal hydroxide + Hydrogen ..

Metal + $\text{Acid}_{(\text{dilute})}\longrightarrow$7 Metal salt + Hydrogen

Metal X + Salt solution of metal Y $\longrightarrow$7 Salt solution of X + Y (Displacement reaction).

(i) Metals such as _____ and _____ react so vigorously that they catch fire if kept in the open. Hence, to protect them and to prevent accidental fires, they are kept immersed in _____.

(a) phosphorus, magnesium, water (b) sodium, potassium, kerosene oil

(c) sodium, potassium, water (d) tin, lead, alcohol

(ii) Which of the following pairs will give displacement reaction?

(a) NaCl solution and copper metal **(b) $MgCl_2$ solution and aluminium metal**

(c) $FeSO_4$ solution and silver metal **(d) $AgNO_3$ solution and copper metal**

(iii) There are four metals K, L, M and N. Identify them by using the hints given below.

K forms basic oxide.

L forms amphoteric oxide.

Oxide of M dissolves in water to form alkali.

N does not react with water at all.

$(a) K \rightarrow \text{Zn}, L \rightarrow \text{Al}, M \rightarrow \text{Na}, N \rightarrow \text{Fe} (b) K \rightarrow \text{Fe}, L \rightarrow \text{Na}, M \rightarrow \text{K}, N \rightarrow \text{Zn}$

$(c) K \rightarrow \text{K}, L \rightarrow \text{Cu}, M \rightarrow \text{Pb}, N \rightarrow \text{Na} (d) K \rightarrow \text{Cu}, L \rightarrow \text{Zn}, M \rightarrow \text{K}, N \rightarrow \text{Pb}$

(iv) Which metal does not react with dilute hydrochloric acid?

(a) Iron (b) Sodium (c) Zinc (d) Copper

(v) Food cans are coated with tin and not with zinc because

(a) zinc is costlier than tin **(b) zinc has a higher melting point than tin**

(c) zinc is more reactive than tin **(d) zinc is less reactive than tin.**

99) On the basis of reactivity of different metals with oxygen, water and acids as well as displacement reactions, the metals have been arranged in the decreasing order of their reactivities. This arrangement is known as activity series or reactivity series of metals.
The basis of reactivity is the tendency of metals to lose electrons. If a metal can lose electrons easily to form positive ions, it will react readily with other substances. Therefore, it will be a reactive metal. On the other hand, if a meal loses electrons less rapidly to form a positive ion, it will react slowly with other substances. Therefore, such a metal will be less reactive.

(i) Which of the following metals is less reactive than hydrogen?

(a) Copper (b) Zinc (c) Magnesium (d) Lead

(ii) Which of the following metals is more reactive than hydrogen?

(a) Mercury (b) Platinum (c) Iron (d) Gold

(iii) Which of the following metals reacts vigorously with oxygen?

(a) Zinc (b) Magnesium (c) Sodium (d) Copper

(iv) Which of the following represents the correct order of reactivity for the given metals?

$(a)\mathrm{Na} > \mathrm{Mg} > \mathrm{Al} > \mathrm{Cu} (b)\mathrm{Mg} > \mathrm{Na} > \mathrm{Al} > \mathrm{Cu} (c)\mathrm{Na} > \mathrm{Mg} > \mathrm{Cu} > \mathrm{Al} (d)\mathrm{Mg} > \mathrm{Al} > \mathrm{Na} > \mathrm{Cu}$

(v) Hydrogen gas is not evolved when a metal reacts with nitric acid. It is because HNO_3 is a strong oxidising agent. It oxidises the H_2 produced to water and itself gets reduced to any of the nitrogen oxides (N_2O, NO, NO_2). But _____ and _____ react with very dilute HNO_3 to evolve H_2 gas.

(a) Pb, Cu (b) Na, K (c) Mg, Mn (d) Al, Zn

100) Non-m;tals are highly electronegative in nature. They have a tendency to gain electrons in their valence shell to achieve nearest noble gas configuration. Thus, they form anions and act as good oxidising agents.

$X \quad + ne^- \longrightarrow X^{n-}$

(non-metal atom) (anion)

They react with air or oxygen on heating to form oxides which react with water to form acids. Thus, nonmetal oxides are acidic in nature. Non-metals do not react with dilute acids at all. This is because they are electronegative and therefore, cannot displace hydrogen from acids but they form covalent hydrides when heated with hydrogen.

(i) The acid formed when sulphur trioxide reacts with water is

(a) sulphurous acid (b) sulphuric acid (c) both (a) and (b) (d) none of these

(ii) An element 'X' forms an oxide XO_2 , which is a very useful gas used in the process of photosynthesis. The element 'X' is

(a) sulphur (b) nitrogen (c) carbon (d) phosphorus

(iii) Non-metals generally act as

(a) oxidising agents (b) reducing agents (c) both (a) and (b) (d) none of these

(iv) Which of the following elements produces basic oxide on reacting with oxygen?

(a) Chlorine (b) Sulphur (c) Phosphorus (d) Magnesium

(v) Which of the following is a covalent hydride?

(a) CH_4 (b) NH_3 (c) H_2S (d) All of these

101) Although there is no sharp line of distinction between metals and non-metals yet there are some distinctive differences. The main points of differences are:

Property	Metals	Non-metals
Electronic structure	They have 1 to 3 electrons in the outermost shell of their atoms	They have 4 to 8 electrons in the outermost shell of their atoms.
State of existence	They are mostly solid at room temperature except mercury and gallium which are liquid.	They are either solids or gases at room temperature (except bromine which is a liquid).
Density	They have high density.	They have low density.
Nature of ions	They are electropositive elements and hence, lose one or more electrons to form positive ions.	They are electronegative elements and hence, gain one or more electrons to form negative ions.
Nature of chlorides	They generally combine with chlorineto form solid ionic chlorides which conduct electricity in the aqueous solution or in the molten state.	They combine with chlorine to form covalen chlorides. These are either gases or liquids. Non-metal chlorides do not contain ions, therefore, they do not conduct electricity.
Nature of oxides	They form basic oxides, though some oxides are amphoteric also.	They form acidic or neutral oxides.
Displacement of hydrogen from acids	Metals which lie above hydrogen in the reactivity series displace hydrogen from acids.	They do not displace hydrogen from acids.

(i) Match column-I with column-II and select the correct option using the given code

Column-I	Column-II
P. A metal that forms amphoteric oxides	(I) Ga
Q. A metal which melts when keep on our palm	(II) Au
R. A metal that has highest density	(III) Al
S. A metal which cannot displace hydrogen from acids	(IV) Os

(a) P-(II), Q-(I), R-(III), S-(IV) **(b) P-(III), Q-(I), R-(IV), S-(II)**

(c) P-(IV), Q-(II), R-(III), S-(I) **(d) P-(III), Q-(II), R-(I), S-(IV)**

(ii) State True (T) or False (F) for the following statements.

(I) Non-metals react with acids to give a salt and hydrogen gas.

(II) Zinc oxide is amphoteric in nature.

(III) Copper oxide is basic in nature.

(IV) Hydrogen gas is evolved when a metal reacts with dilute acid.

(V) Copper reacts vigorously with dilute HCl.

	(I)	(II)	(III)	(IV)	(V)
(a)	**F**	**F**	**F**	**T**	**T**
(b)	**T**	**F**	**T**	**F**	**F**