3. Metals and Non-metals - Board Exam Questions (1 Mark)

Practice these questions online at pschool.in/science/ncert/g10/chap-3

1 Mark Questions (MCQ)

1) *Which of the following is a poor conductor of electricity?*
(a) Pb (b) Cu (c) Ag (d) Al

2) *When an element 'X' reacts with water, it starts floating. Identify the element 'X':*
(a) Potassium (b) Calcium (c) Sodium (d) Iron

3) *When Mg metal is treated with hot water, it starts floating on the surface of the water. The reason for its different behaviour is:*
(a) Mg is a lighter element than water
(b) Mg reacts with water to produce $H_2$ gas which helps in floating
(c) Mg reacts with water to produce $N_2$ gas which helps in floating
(d) Mg reacts with water to form $CO_2$ gas which helps in floating

4) *The reaction of calcium with cold water is:*
(a) Less violent, but the heat evolved is sufficient for the hydrogen to catch fire
(b) Very violent and exothermic and hydrogen catches fire
(c) Exothermic, but the heat evolved is not sufficient for the hydrogen to catch fire
(d) Slow and endothermic

5) *Which one of the following metals does not react with cold water?*
(a) Sodium (b) Potassium (c) Calcium (d) Magnesium

6) *Alloys are homogeneous mixture of metal with a metal or non-metal. Which among the following alloys contain non-metal as one of its constituents?*
(a) Brass (b) Bronze (c) Amalgam (d) Steel

7) *Which of the following is an amphoteric oxide?*
(a) $Na_2O$ (b) $K_2O$ (c) $CO_2$ (d) $Al_2O_3$

8) *Which gas is evolved when magnesium metal reacts with very dilute $HNO_3$?*
(a) Oxygen (b) Nitrogen (c) Hydrogen (d) Nitrogen Dioxide

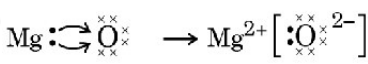
9) *Electrical wires made of aluminum*
(a) corrode easily as aluminium is a very reactive metal
(b) corrode easily because porous flaky aluminium oxide is formed
(c) do not corrode easily as aluminium oxide forms a protective layer
(d) do not corrode easily as aluminium is less reactive than metals like sodium, magnesium and zinc

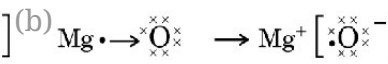
10) *The products formed when Aluminium and Magnesium are burnt in the presence of air respectively are:*
(a) $Al_3O_4$ and $MgO_2$ (b) $Al_2O_3$ and MgO (c) $Al_3O_4$ and MgO (d) $Al_2O_3$ and $MgO_2$

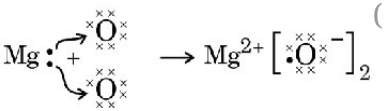
11) *Reaction between two elements A and B, forms a compound C. A loses electrons and B gains electrons. Which one of the following properties will not be shown by compound C?*
(a) It has high melting point
(b) It is highly soluble in water
(c) It has weak electrostatic forces of attraction between its oppositely charged ions
(d) It conducts electricity in its molten state or aqueous solution

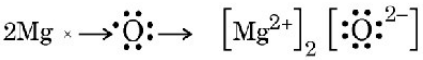
12) *The metals obtained from their molten chlorides by the process of electrolytic reduction are:*
(a) Gold and silver (b) Calcium and magnesium
(c) Aluminium and silver (d) Sodium and iron

13) *The formation of magnesium oxide is correctly shown in option:*

(a) 

(b) 

(c) 

(d) 

14) *Aluminium powder is used in thermit welding because:*

(a) Its reaction with iron is highly exothermic

(b) When it is heated with iron (III) oxide, molten iron is obtained

(c) When it is heated with iron (III) oxide, molten aluminium oxide is obtained to join railway tracks

(d) Its melting point is low as compared to iron and a molten alloy of iron and aluminium is formed on heating which is used to join railway tracks

15) *Two metals zinc and tin are dissolved separately in definite proportions in molten copper (the primary metal) to obtain two different alloys respectively known as:*

(a) Bronze and Brass (b) Brass and Solder (c) Brass and Bronze (d) Solder and Bronze

16) *The most common method of extraction of metals from their oxide ores is:*

(a) Reduction with carbon (b) Reduction with hydrogen

(c) Reduction with aluminium (d) Electrolytic reduction

17) *The property by virtue of which a solid material can be drawn into thin wires is called:*

(a) malleability (b) ductility (c) rigidity (d) resistivity

18) *A metal, M, displaces iron from aqueous solution of ferrous sulphate but fails to do so in case of aqueous solution of aluminium sulphate. The metal M is*

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

19) *During electrolytic refining of copper, the anode, the cathode and the electrolyte used respectively are*
(a) Impure copper, pure copper, acidified copper sulphate solution
(b) Pure copper, impure copper, sulphuric acid
(c) Pure copper, impure copper, acidified copper sulphate solution
(d) Impure copper, pure copper, distilled water

20) *Four statements about the reactions of oxides with dilute hydrochloric acid and aqueous sodium hydroxide are listed.*
*I. Aluminium oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide.*
*II. Calcium oxide reacts with dilute hydrochloric acid and aqueous sodium hydroxide.*
*III. Zinc oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide.*
*IV. Sulphur dioxide does not react with either dilute hydrochloric acid or aqueous sodium hydroxide.*
*Which statements are correct?*
(a) I and II (b) I and III (c) II and IV (d) III and IV

21) *An iron nail is added to each of the two test tubes 'P' and 'Q' containing aqueous copper (II) sulphate, and aqueous silver nitrate respectively. Which of the following observation is correct?*
(a) In test tube 'P' iron nail is coated with a blue coating and in test tube 'Q' there is no reaction
(b) Iron nail is coated with a brown coating in test tube 'P' and silver coating in test tube 'Q'
(c) There is no reaction in either of the test tubes 'P' or 'Q'
(d) There is no reaction in test tube 'P' but a silver coating on iron nail is seen in test tube 'Q'

22) *A metal and a non-metal that exists in liquid state at the room temperature are respectively:*

(a) Bromine and Mercury (b) Mercury and Iodine
(c) Mercury and Bromine (d) Iodine and Mercury

23) *Oxides of aluminium and zinc are:*
(a) acidic (b) basic (c) amphoteric (d) neutral

24) *The oxide which can react with HCl as well as KOH to give corresponding salt and water is*
(a) CuO (b) $Al_2O_3$ (c) $Na_2O$ (d) $K_2O$

25) *Consider the following cases:*
*(a) $CaSO_4$ + Al → (b) $CuSO_4$ + Ca → (c) $FeSO_4$ + Cu → (d) $ZnSO_4$ + Mg →*
*The cases in which new products will form are –*
(a) (a) and (b) (b) (b) and (c) (c) (c) and (d) (d) (b) and (d)

26) *The metals which are found in both free state as well as combined state are:*
(a) Gold and platinum (b) Platinum and silver
(c) Copper and silver (d) Gold and silver

27) *A metal 'X' is used in thermit process. When 'X' is heated with oxygen, it gives an oxide 'Y', which is amphoteric in nature. 'X' and 'Y' respectively are:*
(a) Mn, $MnO_2$ (b) Al, $Al_2O_3$ (c) Fe, $Fe_2O_3$ (d) Mg, MgO

28) *Match column I with column II and select the correct option using the given codes.*
*Column I: Column II*
*a. A metal that forms amphoteric oxides: (i) Ga*
*b. A metal which melts when kept on our palm: (ii) Au*
*c. A metal that reacts with nitric acid: (iii) Al*
*d. A metal which cannot displace hydrogen from acids: (iv) Mn*
(a) a – (ii), b – (i), c – (iii), d – (iv)
(b) a – (iii), b – (i), c – (iv), d – (ii)

(c) a – (iv), b – (ii), c – (iii), d – (i)
(d) a – (iii), b – (ii), c – (i), d – (iv)

29) *The electronic configuration of three elements X, Y and Z are X - 2, 8, 7; Y - 2, 8, 2; and Z - 2, 8*
(a) Y and Z are metals (b) Y and X are non-metals
(c) X is a non-metal and Y is a metal (d) Y is a non-metal and Z is a metal

30) *Among the following, the metal with lowest density is:*
(a) Lithium (b) Lead (c) Magnesium (d) Aluminium

31) *The number of electrons in the outermost shell of the atom of a non-metal can be:*
(a) 1, 2 or 3 (b) 3, 4 or 5 (c) 5, 6 or 7 (d) 5, 6 or 8

32) *Which of the following statements is true for an amphoteric oxide?*
(a) It reacts only with acid and does not form water
(b) It reacts with acid as well as base to form salt and hydrogen gas
(c) It reacts with both acid as well as base to form salt and water
(d) It reacts only with base and does not form water

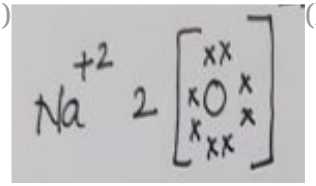
33) *Metal oxides generally react with acids, but few oxides of metal also react with bases. Such metallic oxides are:*
*I. MgO II. ZnO III. $Al_2O_3$ IV. CaO*
(a) I and II (b) II and III (c) III and IV (d) I and IV

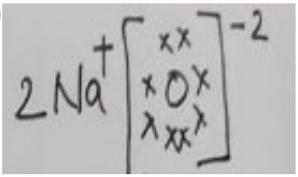
34) *Bronze is an alloy of*
(a) Copper and Zinc (b) Aluminium and Tin
(c) Copper, Tin and Zinc (d) Copper and Tin

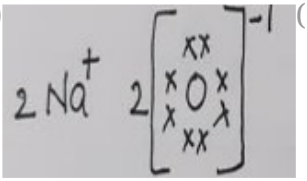
35) *On adding dilute sulphuric acid to a test tube containing a metal 'X', a colourless gas is produced when a burning match stick is brought near it. Which of the following correctly represents metal 'X'?*

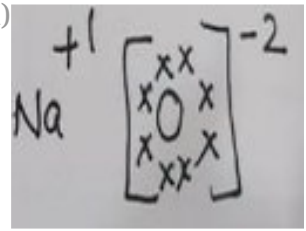
(a) Sodium (b) Sulphur (c) Copper (d) Silver

36) *Which one of the following correctly represents Sodium oxide?*

(a) 


(b) 


(c) 


(d) 


37) *An element with atomic number_____ will form a basic oxide.*
(a) 7 (2,5) (b) 17 (2,8,7) (c) 14 (2,8,4) (d) 11 (2,8,1)

38) *An element 'M' has 50% of the electrons filled in the 3rd shell as in the 2nd shell. The atomic number of 'M' is:*
(a) 10 (b) 12 (c) 14 (d) 18

39) *With the reference to four gases $CO_2$, CO, $Cl_2$ and $O_2$, which one of the options in the table is correct?*
(a) Acidic oxide: CO, Used in treatment of water: $Cl_2$, Product of respiration: $O_2$, Product of incomplete combustion: CO
(b) Acidic oxide: $CO_2$, Used in treatment of water: $Cl_2$, Product of respiration: $CO_2$, Product of incomplete combustion: CO
(c) Acidic oxide: $CO_2$, Used in treatment of water: $O_2$, Product of respiration: $O_2$, Product of incomplete combustion: $CO_2$
(d) Acidic oxide: CO, Used in treatment of water: $O_2$, Product of respiration: $CO_2$, Product of incomplete combustion: $CO_2$

40) *On placing a copper coin in a test tube containing green ferrous sulphate solution, it will be observed that the ferrous sulphate solution*
(a) turns blue, and a grey substance is deposited on the copper coin
(b) turns colourless and a grey substance is deposited on the copper coin
(c) turns colourless and a reddish–brown substance is deposited on the copper coin
(d) remains green with no change in the copper coin

Assertion and Reason

1) *Assertion (A): The metals high up in the reactivity series cannot be obtained from their compounds by heating with carbon.*
*Reason (R): Displacement reactions can also be used to obtain metal.*

2) *Assertion (A): Hydrogen gas is not evolved when a metal reacts with nitric acid.*
*Reason (R): Nitric acid is a strong reducing agent and reduces the hydrogen produced in the reaction to water.*

3) *Assertion (A): Hydrogen gas is not evolved when zinc reacts with nitric acid.*
*Reason (R): Nitric acid oxidises the hydrogen gas produced to water and itself gets reduced.*

4) *Assertion (A): Different metals have different reactivities with water and dilute acids.*
*Reason (R): Extraction of a metal from its ore depends on its position in the reactivity series.*

5) *Assertion (A): A piece of Zinc metal gets reddish brown coating when kept in copper sulphate solution for some time.*
*Reason (R): Copper is more reactive metal than Zinc.*

6) *Assertion (A): The extraction of metals from their sulphide ores cannot take place without roasting of the ore.*
*Reason (R): Roasting converts sulphide ores directly into metals.*

7) *Assertion (A): The colour of aqueous solution of copper sulphate turns colourless when a piece of lead is added to it.*
*Reason (R): Lead is more reactive than copper, and hence displaces copper from its salt solution.*

8) *Assertion (A): Sodium oxide is an amphoteric oxide.*
*Reason (R): Metal oxides which react with both acids as well as bases are known as amphoteric oxides.*