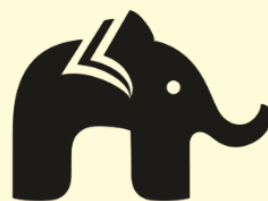




PRACTICE MCQS

CLASS 10 SCIENCE (TERM - I)
METALS AND NON-METALS

BY
learn-o-hub
learning simplified





Question 1:

Which of the following metal is sonorous?

- (a) Sodium
- (b) Potassium
- (c) Mercury
- (d) Aluminium

Answer: (d) Aluminium

The metals that produce a sound on striking a hard surface are said to be sonorous.

Question 2:

The non-metal that does not exist in solid or gaseous form in room temperature is _____ .

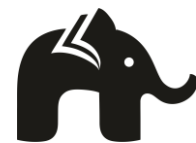
- (a) Bromine
- (b) Carbon
- (c) Oxygen
- (d) Iodine

Answer: (a) Bromine

The non-metals are either solids or gases except bromine which is a liquid.

Question 3:

Aqua Regia (Latin for Royal Water) a highly corrosive fuming liquid that can dissolve Gold is a mixture of concentrated Hydrochloric acid and concentrated Nitric acid in the ratio _____



(a) 1 : 1

(b) 3 : 1

(c) 3 : 3

(d) 1 : 3

Answer: (b) 3 : 1

Question 4:

Read the following statements and check whether they are true or false:

Statement 1: Metals such as Sodium and Potassium react so vigorously with oxygen that they catch fire if kept in the open. Hence they are kept immersed in kerosene oil.

Statement 2: Sodium oxide and Potassium oxide dissolve in water to produce alkalis.

(a) Both the statements are true

(b) Both the statements are false

(c) Statement 1 is true, Statement 2 is false

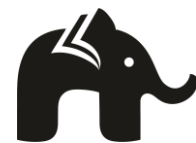
(d) Statement 2 is true, Statement 1 is false.

Answer: (a) Both the statements are true.

Question 5:

The compound like Sodium chloride is formed by the transfer of electrons from a metal to a non-metal and is known as _____ .

(a) Ionic compound



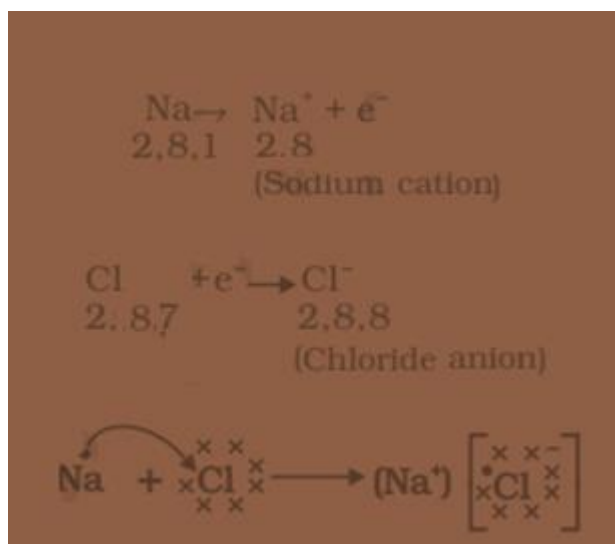
(b) Electrovalent compound

(c) Covalent compound

(d) Both (a) and (b)

Answer: (d) both (a) and (b)

Sodium and chloride ions (sodium loses one electron to become positively charged and chlorine gains one electron to become negatively charged), being oppositely charged, attract each other and are held by strong electrostatic forces of attraction to exist as sodium chloride (NaCl).



Question 6:

Ionic compounds are generally _____ that are soluble in water with _____ melting and boiling points.

(a) Liquids, low

(b) Liquids, high

(c) Solids, low

(d) Solids, high



Answer: (d) solids, high

Question 7:

Which of the following statements are true?

- i) Minerals are solid substances present in nature made up of one or more than one element combined together.
- ii) Ore is a natural rock or sediment that contains one or more valuable minerals, typically containing metals that can be mined.
- iii) The metals at the top of the activity series are found in nature as free elements.

- (a) Only (i) is true
- (b) Only (ii) is true
- (c) Both (i) and (ii) is true
- (d) (i) , (ii) , (iii) is true

Answer: (c) Both (i) and (ii) is true

(iii) is false. The metals at the top of the activity series are highly reactive and are never found in nature as free elements.

Question 8:

The metals at the bottom of the activity series are least reactive and they are found in _____ .

- (a) Free state
- (b) Compound state
- (c) Sulphide or oxide ores
- (d) Carbonates



Answer: (a) Free state

Metals like gold, silver, platinum and copper are least reactive and are found in a free state in nature.

Question 9:

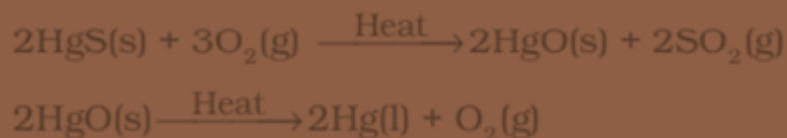
Ores mined from earth are usually contaminated with large amounts of impurities such as soil, sand etc. called _____ .

- (a) Mineral
- (b) Metal
- (c) Dust particles
- (d) Gangue

Answer: (d) Gangue

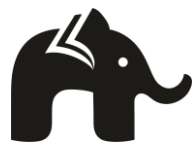
Ores mined from earth are usually contaminated with large amounts of impurities such as soil, sand etc. called gangue. The impurities must be removed from the ore prior to the extraction of the metal.

Question 10:



The above set of reactions represent the extraction of _____ from its ore _____ .

- (a) Sulphur dioxide, mercuric sulphide
- (b) Mercury, Cinnabar



(c) Mercuric oxide, cinnabar

(d) Oxygen, Cinnabar

Answer: (b) Mercury, Cinnabar

cinnabar (HgS) is an ore of mercury. When it is heated in air, it is first converted into mercuric oxide (HgO). Mercuric oxide is then reduced to mercury on further heating.

Question 11:

The process in metallurgy in which the sulphide ores are converted into oxides by heating strongly in the presence of excess air is known as _____ .

(a) Roasting

(b) Calcination

(c) Purification

(d) Refining

Answer: (a) Roasting

Question 12:

The process in metallurgy where carbonate ores are changed into oxides by heating strongly in limited air is known as _____ .

(a) Roasting

(b) Calcination

(c) Purification

(d) Refining



Answer: (b) Calcination

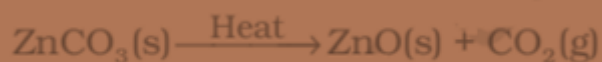
Question 13:

Among the following reactions, which reaction represents the calcination reaction?

Reaction 1:



Reaction 2:



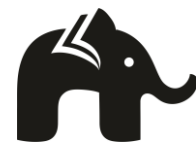
- (a) Reaction 1
- (b) Reaction 2
- (c) Both the reactions
- (d) None of the above

Answer: (b) Reaction 2

The process in metallurgy where carbonate ores are changed into oxides by heating strongly in limited air is known as calcination. Zinc carbonate is heated in limited supply of air to obtain zinc oxide and carbon dioxide. Then zinc oxide is heated with carbon to obtain metallic zinc.

Question 14:

Metals like sodium, magnesium and calcium are obtained by _____ .



- (a) Reducing the oxides of sodium, magnesium and calcium using carbon
- (b) Roasting or calcination
- (c) Heating their sulphides in excess air
- (d) Electrolysis of their molten chlorides

Answer: (d) Electrolysis of their molten chlorides

The metals are deposited at the cathode (the negatively charged electrode), whereas chlorine is liberated at the anode (the positively charged electrode). The reactions are –



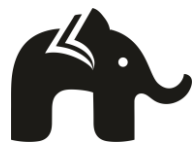
Similarly, aluminium is obtained by the electrolytic reduction of aluminium oxide.

Question 15:

Which of the following statements are true?

- i) The extraction of metals from their ores and then refining them for use is known as metallurgy.
- ii) Non-metals are neither malleable nor ductile.
- iii) An alloy is a homogeneous mixture of two or more metals, or a metal and a nonmetal.
- iv) Silver articles become black after some time when exposed to air. This is because it reacts with sulphur in the air to form a coating of silver sulphide.

- (a) i , ii , iii , iv
- (b) only i , ii
- (c) only iii



(d) only iv

Answer: (a) i , ii , iii , iv

Question 16:

Galvanisation is a method of protecting steel and iron from rusting by coating them with a thin layer of _____ .

- (a) sodium
- (b) silver
- (c) zinc
- (d) gold

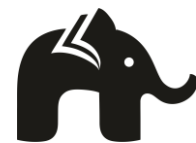
Answer: (c) zinc

Question 17:

Brass: alloy of copper and zinc:: bronze: _____

- (a) alloy of copper and lead
- (b) alloy of copper and tin
- (c) alloy of copper and aluminium
- (d) alloy of copper and silver

Answer: (b) alloy of copper and tin



Question 18:

When iron is mixed with nickel and chromium we get _____ .

- (a) indolium
- (b) aluminium
- (c) stainless steel
- (d) bronze

Answer: (c) stainless steel

Assertion Reason Based Questions

Answer the following questions selecting the appropriate option given below:

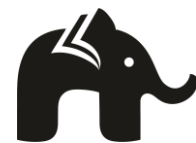
- (a) Both A and R are true and R is the correct explanation of A
- (b) Both A and R are true and R is not the correct explanation of A
- (c) A is true but R is false
- (d) A is False but R is true

Question 19:

Assertion: Most of the cooking vessels are made of Copper or Aluminium

Reason: Copper and Aluminium are good conductors of heat and have high melting points.

Answer: (a) Both A and R are true and R is the correct explanation of A

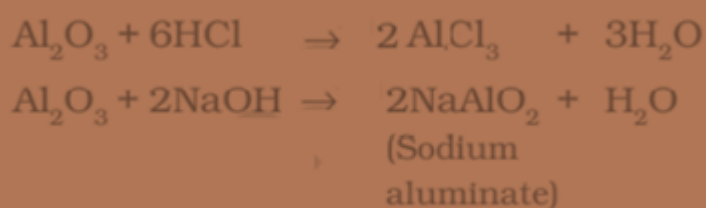
**Question 20:**

Assertion: Aluminium oxide is called amphoteric oxide.

Reason: Aluminium oxide reacts with both acids as well as bases to produce salts and water.

Answer: (a) Both A and R are true and R is the correct explanation of A.

Aluminium oxide reacts with both acids as well as bases to produce salts and water. The following chemical reaction represents the amphoteric nature of Aluminium oxide.

**Question 21:**

Assertion: Hydrogen gas is not evolved when a metal reacts with nitric acid.

Reason: HNO_3 is a weak oxidising agent.

Answer: (c) A is true but R is false

Hydrogen gas is not evolved when a metal reacts with nitric acid. It is because HNO_3 is a strong oxidising agent. But Mg reacts with very dilute nitric acid to evolve H_2 gas.



Case study based questions

Question 22:

The property of metals that defines their ability to be beaten into thin sheets is called malleability. The hard or brittle metals are less malleable. The ability of metals to be drawn into thin wires is called ductility. It is because of malleability and ductility the metals can be given different shapes according to our needs.

(1) Which of the following metal is the most malleable?

- (a) Copper
- (b) Lead
- (c) Tin
- (d) Gold

(2) It is found that a wire of 2km length can be drawn from one gram of gold. Here gold exhibits _____ property.

- (a) Malleability
- (b) Ductility
- (c) Chemical
- (d) Lustrous

(3) The ability of metals to be beaten into thin sheets and to be drawn into thin wires is a _____ .

- (a) Electrical property
- (b) Chemical property
- (c) Physical property



(d) All of the above

(4) Arrange the following metals in increasing order of their malleability:

Gold, Copper, Lead, Iron

(a) Iron, Lead, Copper, Gold

(b) Iron, Copper, Lead, Gold

(c) Copper, Gold, Lead, Iron

(d) Gold, Copper, Iron, Lead

(5) Match the following:

A) Silver	i) Lustrous non-metal
B) Iodine	ii) Allotrope of carbon
C) Graphite	iii) Melts in room temperature
D) Caesium	iv) Malleable and ductile

(a) A - i , B - iv , C - ii , D - iii

(b) A - iv , B - i , C - ii , D - iii

(c) A - i , B - ii , C - iv , D - iii

(d) A - iv , B - ii , C - iii , D - i



Answer:

(1) (d) Gold

Gold is the most malleable and ductile metal.

(2) (b) Ductility property

The ability of metals to be drawn into thin wires is called ductility.

(3) (c) Physical property

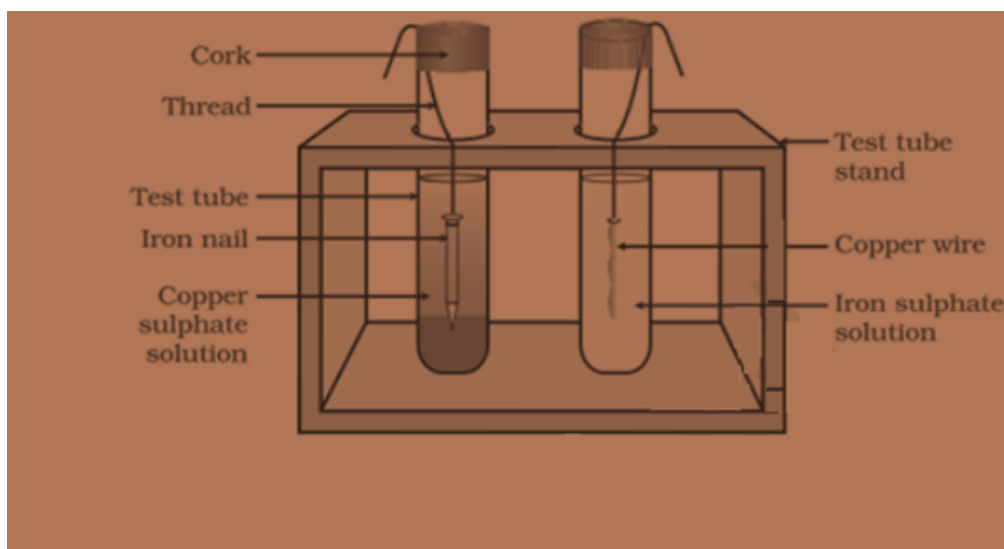
(4) (a) Iron, Lead, Copper, Gold

Gold is the most malleable metal.

(5) (b) A – iv , B – i , C – ii , D – iii

Question 23:

Suma and Sudhama conducted the following activity under the guidance of their Science teacher. Suma placed a copper wire in a test tube containing a solution of iron sulphate and Sudhama placed an iron nail in a test tube containing a solution of copper sulphate. They recorded their observations.



(1) In which test tube do you think the reaction occurred first?

- (a) Test tube containing iron sulphate solution
- (b) Test tube containing copper sulphate solution
- (c) In both the test tubes
- (d) None of the above

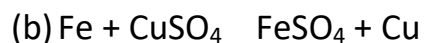
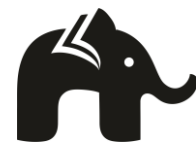
(2) Assertion: Copper displaces Iron from Iron sulphate solution and forms Copper sulphate

Reason: Iron is more reactive than copper

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

(3) Choose the chemical reaction that takes place in the activity performed by Suma and Sudhama:

- (a) $\text{Cu} + \text{FeSO}_4 \rightarrow \text{CuSO}_4 + \text{Fe}$



(c) Both (a) and (b)

(d) None of the above

(4)



This type of chemical reaction is called as _____ .

(a) Precipitation reaction

(b) Decomposition reaction

(c) Combustion reaction

(d) Displacement reaction

(5) Some metals do not react with reagents like water, oxygen and acids. All metals are not equally reactive. The above type of reactions as mentioned in question 4, give better evidence of reactivity of metals.

Arrange the following metals in decreasing order of their reactivity:

Na, Mg, Zn, Al, Ag, Au, K

(a) K, Na, Mg, Al, Zn, Ag, Au

(b) K, Na, Al, Mg, Ag, Zn, Au

(c) Au, Ag, Zn, Al, Mg, Na, K

(d) Au, Ag, Al, Zn, Na, Mg, K

Answer:

(1) (b) test tube containing copper sulphate solution



Iron displaces copper from copper sulphate solution which is blue in colour, forming ferrous sulphate which is green in colour.

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

Iron displaces copper from copper sulphate solution forming iron sulphate.

(3) (b) $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$

(4) (d) displacement reaction

(5) (a) K, Na, Mg, Al, Zn, Ag, Au

Potassium is most reactive and Gold is least reactive.

Question 24:

Thermit was discovered by a German chemist, Hans Goldschmidt, in 1895. The term is a registered trade name of Thermex Metallurgical Inc. The metal formed in the process is carbon-free but usually contains small amounts of aluminium. The powder consists of aluminium and the oxide of a metal such as iron. When ignited or heated, it gives off an enormous amount of heat as a result of the chemical combination of the aluminium with the oxygen of the oxide. The reaction temperature is estimated to be about $2,400^\circ \text{C}$ ($4,400^\circ \text{F}$).

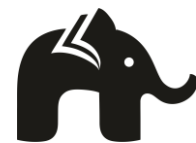
(1) The thermite reaction is used to join railway tracks or cracked machine parts.

(a) The above statement is true

(b) The above statement is false

(c) It is used only to join railway tracks

(d) It is used only to join cracked machine parts



(2) Which of the following represent the thermite reaction of iron oxide with aluminium?

- (a) $\text{Fe}_2\text{O}_3 (\text{s}) + \text{Al} (\text{s}) \rightarrow 2 \text{Fe} (\text{l}) + \text{Al}_2\text{O}_3 (\text{s}) + \text{Heat}$
- (b) $\text{Fe}_2\text{O}_3 (\text{s}) + 2 \text{Al} (\text{s}) \rightarrow 2 \text{Fe} (\text{l}) + \text{Al}_2\text{O}_3 (\text{s})$
- (c) $\text{Fe}_2\text{O}_3 (\text{s}) + 2 \text{Al} (\text{s}) \rightarrow 2 \text{Fe} (\text{l}) + \text{AlO}_3 (\text{s}) + \text{Heat}$
- (d) $\text{Fe}_2\text{O}_3 (\text{s}) + 2 \text{Al} (\text{s}) \rightarrow 2 \text{Fe} (\text{l}) + \text{Al}_2\text{O}_3 (\text{s}) + \text{Heat}$

(3) These reactions are highly _____

- (a) Endothermic
- (b) Exothermic
- (c) Both endothermic and exothermic
- (d) Volatile

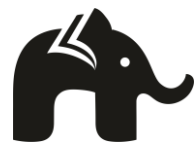
(4) From the thermite reaction of iron oxide with aluminium we can infer that,

- (a) Aluminium is more reactive when compared to Iron
- (b) Iron is more reactive when compared to Aluminium
- (c) Both Aluminium and Iron are equally reactive
- (d) None of the above

Answer:

(1) (a) The above statement is true

(2) (d) $\text{Fe}_2\text{O}_3 (\text{s}) + 2 \text{Al} (\text{s}) \rightarrow 2 \text{Fe} (\text{l}) + \text{Al}_2\text{O}_3 (\text{s}) + \text{Heat}$



(3) (b) Exothermic

The amount of heat produced is so large that the metals are produced in the molten state.

(4) (a) Aluminium is more reactive when compared to Iron

As we move from potassium to gold in the activity series, the reactivity of the metals decreases. Al is more reactive when compared to Fe.
