

Case study based questions
10th Science

Metals and Non- Metals

Passage - 1

5 Marks



Metal, is any of a class of substances characterized by high electrical and thermal conductivity as well as by malleability, ductility, and high reflectivity of light. The most abundant varieties in the Earth's crust are aluminum, iron, calcium, sodium, potassium, and magnesium. The vast majority of metals are found in ores (mineral-bearing substances), but a few such as copper, gold, platinum, and silver frequently occur in the free state because they do not readily react with other elements.

Q 1. What is the class of substances characterized by high electrical and thermal conductivity ?

- (1) Metals
- (2) Non-Metals

Q 2. What are properties of metals?

- (1) Malleability
- (2) Ductility
- (3) High reflectivity of light

(4) All of the above

Q 3. The vast majority of metals are found in _____.

- (1) Earth's crust
- (2) Ores
- (3) Sea

Q 4. The most abundant varieties of material in Earth's crust are _____, _____ etc

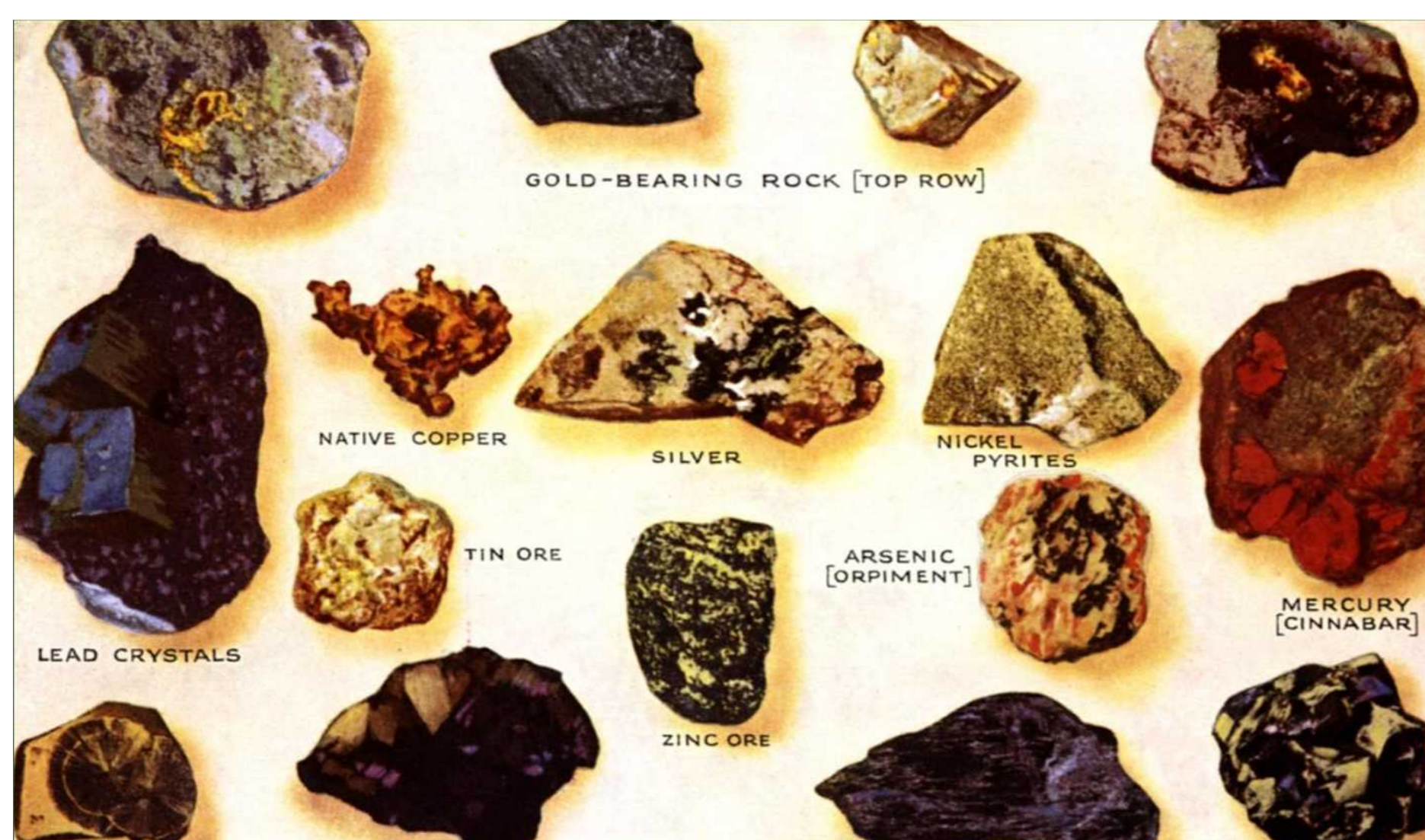
- (1) Aluminium
- (2) Iron
- (3) Gold
- (4) Both A and B

Q 5. True or False. Metals are not ductile.

- (1) TRUE
- (2) FALSE

Passage - 2

5 Marks



Nonmetal, is a substance having a finite activation energy (band gap) for electron conduction. This means that nonmetals display low (insulators) to mod-

erate (semiconductors) bulk electrical conductivities, which increase with increasing temperature, and are subject to dielectric breakdown at high voltages and temperatures. Like metals, nonmetals may occur in the solid, liquid, or gaseous state. Oxygen, carbon, sulfur and chlorine are examples of non-metal elements.

Q 1. _____ is a substance having a finite activation energy (band gap) for electron conduction.

- (1) Non metal
- (2) Metal

Q 2. Non metals display low conductivity are called as

- (1) Insulators
- (2) Semiconductors
- (3) Conductors

Q 3. Non metals are in the form of-

- (1) Solid
- (2) Liquid
- (3) Gaseous
- (4) All of the above

Q 4. State True or False. Increasing temperature, are subject to dielectric breakdown at high voltages and temperatures.

- (1) TRUE
 - (2) FALSE
-

Q 5. Examples of non-metals are-

- (1) Oxygen
- (2) Carbon
- (3) Chlorine
- (4) All of the above

Passage - 3

5 Marks



Metalloid, is an imprecise term used to describe a chemical element that forms a simple substance having properties intermediate between those of a typical metal and a typical nonmetal. The term is normally applied to a group of between six and nine elements (boron, silicon, germanium, arsenic, antimony, tellurium, and possibly bismuth, polonium, astatine) found near the center of the P-block or main block of the periodic table.

Q 1. _____ are having properties of both metals and non metals.

- (1) Non metal
- (2) Metal
- (3) Metalloid

Q 2. Metalloid are found in _____ block of periodic table.

- (1) P
- (2) S

Q 3. Examples of metalloids are-

- (1) Boron
- (2) Silicon
- (3) Arsenic
- (4) All of the above

Q 4. Metalloids are found in group of between six and _____ elements

- (1) Six
- (2) Nine
- (3) Seven
- (4) Eight

Q 5. State True or False. Boron is a metalloid.

- (1) TRUE
- (2) FALSE

Passage - 4

5 Marks



The process of extracting metal ores buried deep underground is called Mining. The metal ores are found in the earth's crust in varying abundance. The extraction of metals from ores is what allows us to use the minerals in the ground! The ores are very different from the finished metals that we see in buildings and bridges. Ores consist of the desired metal compound and the impurities and earthly substances called Gangue. The extraction of metals and its isolation occurs over a few major steps: Concentration of Ore, Isolation of metal from concentrated Ore, Purification of the metal.

Q 1. The process of extracting metal ores buried deep underground is called _____.

- (1) Gangue
- (2) Mining

Q 2. State True or False. The extraction of metals from ores is what allows us to use the minerals in the ground.

- (1) TRUE
- (2) FALSE

Q 3. Ores consist of the desired metal compound and the impurities and earthly substances which are called as

- (1) Gangue
- (2) Mining

Q 4. The extraction of metals and its isolation involves steps like-

- (1) Concentration of ores
 - (2) Isolation of metal from concentrated Ore
 - (3) Purification of the metal
-

(4) All of the above

Q 5. State True or False. The metal ores are found in the earth's crust in varying abundance.

- (1) TRUE
- (2) FALSE

Passage - 5

5 Marks



Corrosion is a dangerous and extremely costly problem. Because of it, buildings and bridges can collapse, oil pipelines break, chemical plants leak, and bathrooms flood. Corroded electrical contacts can cause fires and other problems, corroded medical implants may lead to blood poisoning, and air pollution. Corrosion has caused damage to works of art around the world.

Q 1. Why is corrosion dangerous?

- (1) Buildings and bridges can collapse
- (2) Buildings and bridges stay strong

Q 2. State True or False. Corrosion leads to weakening of buildings and oil pipelines.

- (1) TRUE
- (2) FALSE

Q 3. State True or False. Corrosion can cause dangerous and extremely costly problem.

- (1) TRUE
- (2) FALSE

Q 4. Medical implants which are corroded can cause_____.

- (1) Brain disorder
- (2) Blood poisoning

Q 5. Does corrosion affect human health?

- (1) Yes
 - (2) No
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Passage - 1

5 Marks

When a piece of zinc metal is placed in a solution of mercuric chloride, a white layer of layer of mercury is deposited on zinc metal to give it a silvery shiny look. This is because mercury is lower to zinc in reactivity series and hence zinc can be displaced by mercury from $HgCl_2$.

Q 1. Which of the following reaction takes place when zinc metal is placed in a solution of mercuric chloride?

- (1) Displacement of mercury from mercuric chloride
- (2) Displacement of zinc from zinc chloride

Q 2. Which metal is more reactive Mercury or Zinc?

- (1) Mercury
- (2) Zinc

Q 3. Which of the following is the most reactive ?

- (1) Sodium
- (2) Copper
- (3) Mercury
- (4) Zinc

Q 4. The process of depositing a layer of Zinc on metal to prevent rusting is known as-

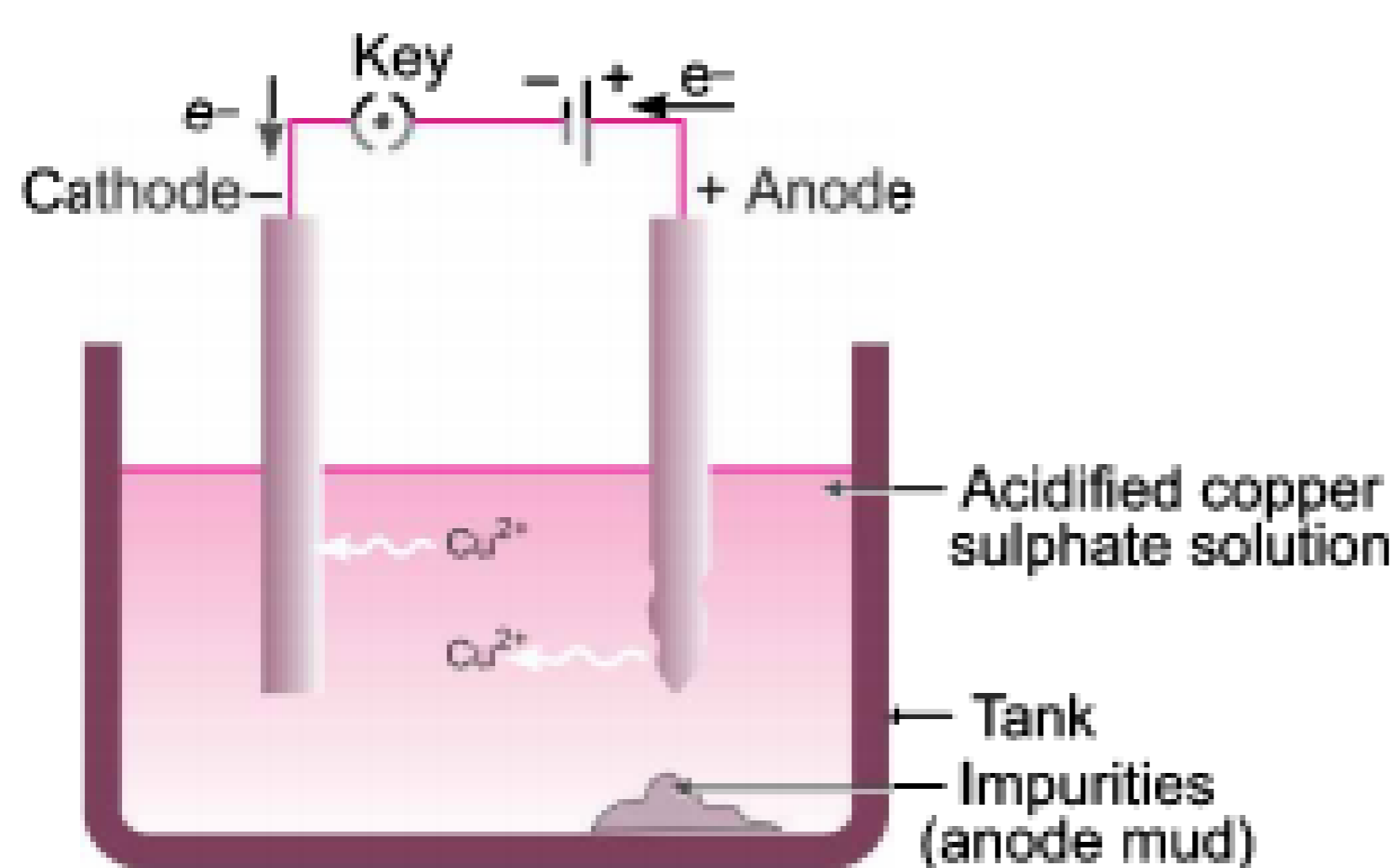
- (1) Oxidation
- (2) Ionization
- (3) Galvanisation
- (4) None of The Above

Q 5. Mercury is a Metal or Non-Metal?

- (1) METAL
- (2) NON-METAL

Passage - 2

5 Marks



In electrolytic refining process, the impure metal is made as anode and a thin strip of pure metal is made as cathode. A solution of the metal salt is made as an electrolyte. On passing the current through the electrolyte. An equivalent amount of pure metal from the electrolyte is deposited on the cathode. The soluble impurities go into the solution, the insoluble impurities settle down at the bottom of the anode and are known as anode mud.

Q 1. Cathode is made up of _____.

- (1) Strip of metal
- (2) Strip of non metal
- (3) Strip of metalloid

Q 2. What happens to the soluble impurities?

- (1) Go to the bottom of the anode
- (2) Go into the solution

Q 3. Pure metal can be used to make ?

- (1) Cathode
- (2) Anode

Q 4. State True or False. Pure metal from the electrolyte is deposited on cathode.

- (1) TRUE
- (2) FALSE

Q 5. In electrolytic refining process what are made?

- (1) Cathode
- (2) Anode
- (3) Both A and B

Passage - 3

5 Marks



Elements are divided into metals and non-metals. All metals are electrical conductors. Many of them have a high density and they are usually ductile and malleable. All these properties influence the way the metals are used. Some metals are sonorous and so they are used for special purposes.

Q 1. True or false. Aluminium is hammered and bent to make large structures for use in ships and planes.

- (1) TRUE
- (2) FALSE

Q 2. Metal that has a low density is

- (1) Sodium
- (2) Potassium
- (3) Hydrogen
- (4) Lithium

Q 3. Some metals are cast into bells. What property must the chosen metals have?

- (1) Ductile
- (2) Malleable
- (3) Both A and B

Q 4. State TRUE or FALSE: Metals are good conductors of electricity.

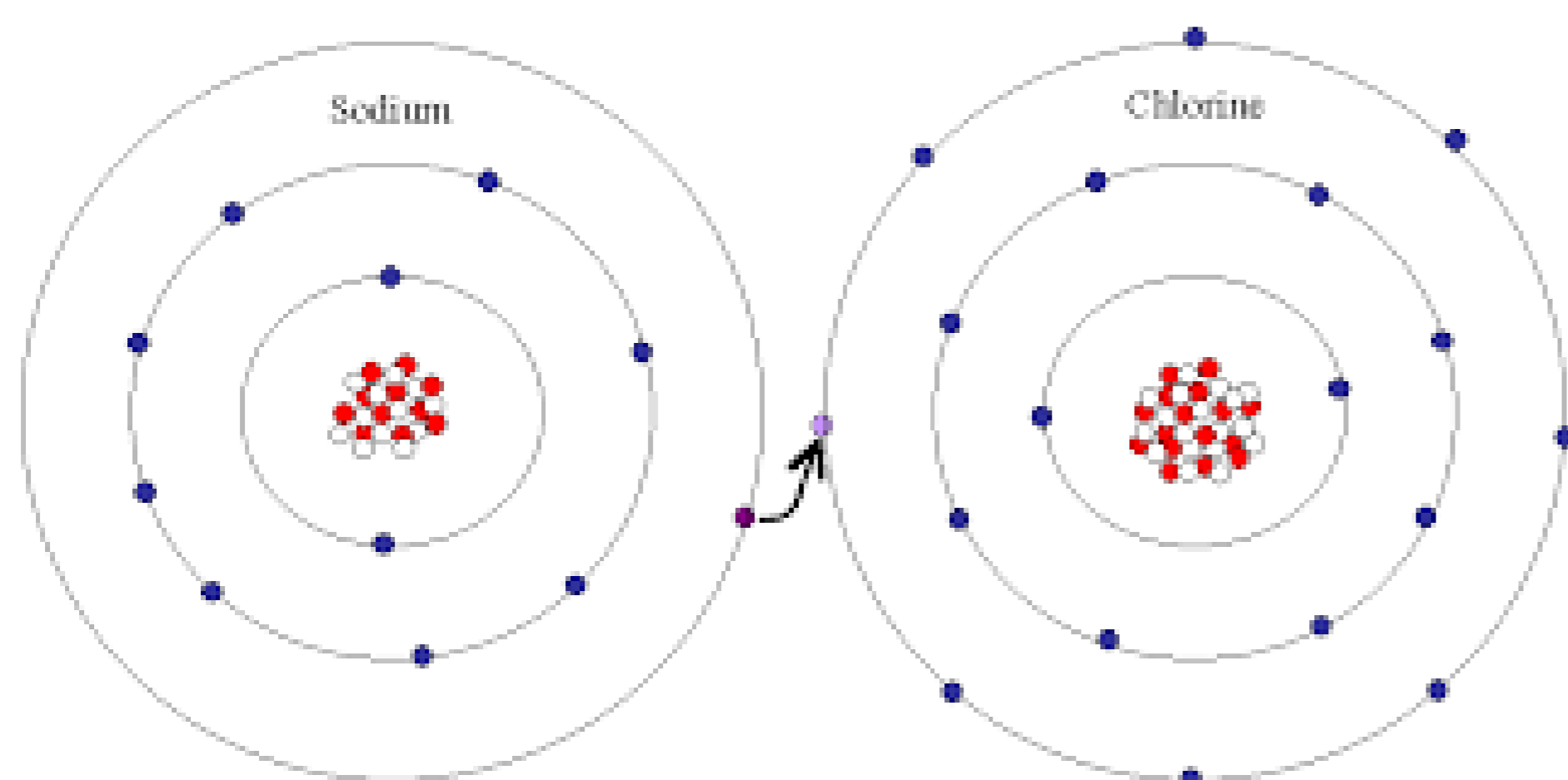
- (1) TRUE
- (2) FALSE

Q 5. State TRUE or FALSE: Non-Metals are good conductors of heat.

- (1) TRUE
- (2) FALSE

Passage - 4

5 Marks



Sodium and chloride ions, being oppositely charged, attract each other and are held by strong electrostatic forces of attraction to exist as sodium chloride (NaCl). It should be noted that sodium chloride does not exist as molecules but aggregates of oppositely charged ions.

Q 1. Sodium in Sodium chloride is oppositely charged with _____.

- (1) Chlorine
- (2) Flourine

Q 2. Chemical formula of salt is _____.

- (1) FeCl

(2) NaCl

Q 3. Does sodium chloride exist as molecules?

(1) YES

(2) NO

Q 4. Sodium and chloride are attracted by _____ force.

(1) Kinetic

(2) Electrostatic

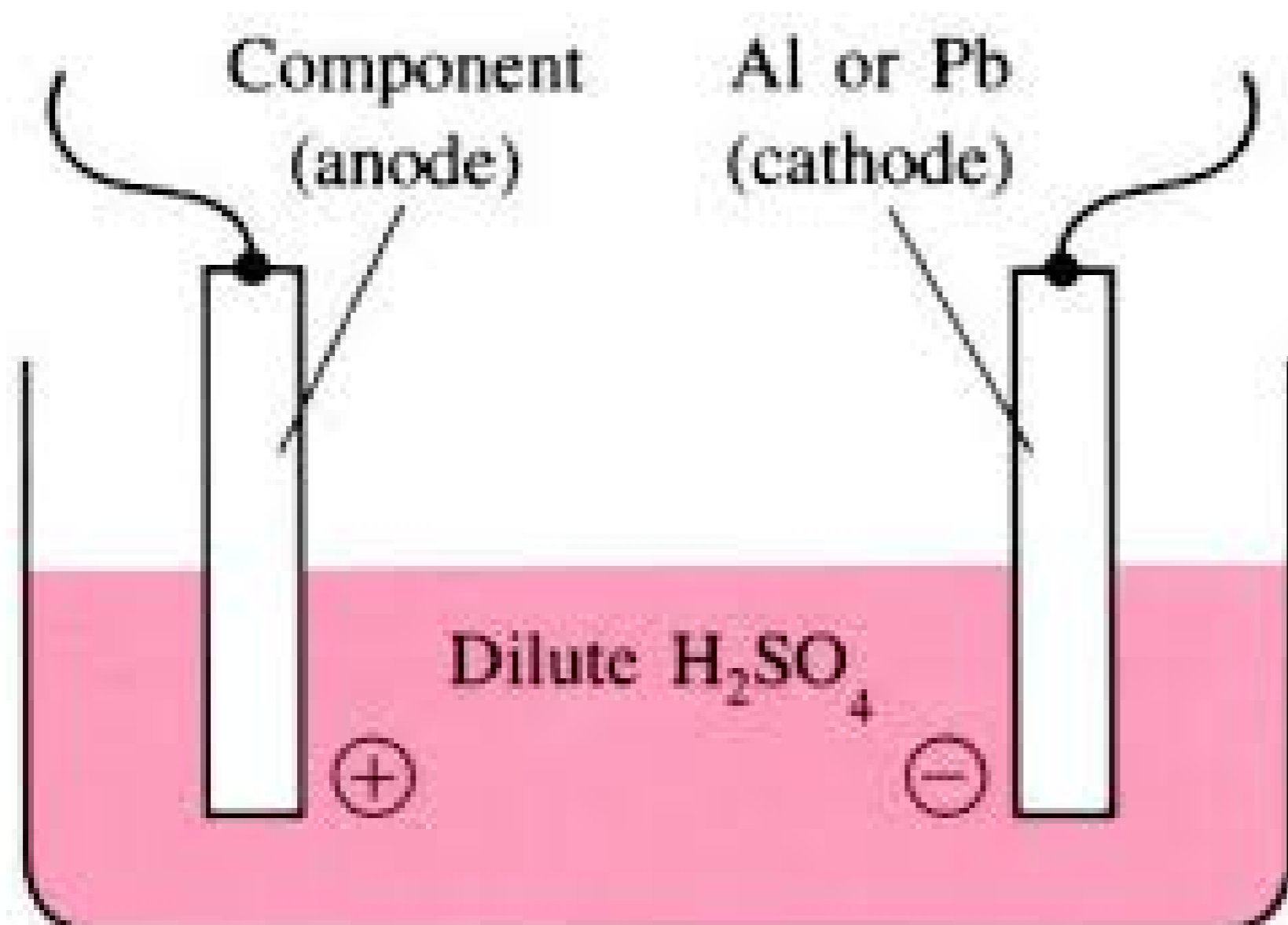
Q 5. State TRUE or FALSE: Sodium chloride exists as molecules.

(1) TRUE

(2) FALSE

Passage - 5

5 Marks



Anodising is a process of forming a thick oxide layer of aluminium. Aluminium develops a thin oxide layer when exposed to air. This aluminium oxide coat makes it resistant to further corrosion. The resistance can be improved further by making the oxide layer thicker. During anodising, a clean aluminium article is

made the anode and is electrolysed with dilute sulphuric acid. The oxygen gas evolved at the anode reacts with aluminium to make a thicker protective oxide layer. This oxide layer can be dyed easily to give aluminium articles an attractive finish.

Q 1. Aluminium develops a thin oxide layer when

- (1) Exposed to water
- (2) Exposed to air

Q 2. Aluminium oxide coat prevents?

- (1) Corrosion
- (2) Ionising

Q 3. Resistance of corrosion can be improved by?

- (1) Making oxide layer
- (2) Making oxide layer thicker

Q 4. Process of thickening of oxide layer to prevent corrosion is called_____.

- (1) Anodising
- (2) Corrosion

Q 5. State true or false: Oxide layer can be dyed easily to give aluminium articles an attractive finish.

- (1) TRUE
 - (2) FALSE
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