
Case study based questions
10th Science

Metals and Non- Metals**Passage - 1****5 Marks**

Reactive metals can displace less reactive metals from their compounds in solution or molten form. All metals are not equally reactive. The reactivity of various metals with oxygen, water and acids. But all metals do not react with these reagents. So we were not able to put all the metal samples we had collected in decreasing order of their reactivity. Displacement reaction give better evidence about the reactivity of metals.

Q1. (2) FALSE

Q2. (1) Displacement

Q3. (2) NO

Q4. (2) All Metals do not react with reagents

Q5. (4) All of the above

Passage - 2**5 Marks**



Ores mined from the 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. The processes Several steps are involved in the extraction of pure metal from ores. Metals and Non-metals are used for removing the gangue from the ore are based on the differences between the physical or chemical properties of the gangue and the ore. Different separation techniques are accordingly employed.

Q1. (4) Both A and B

Q2. (1) Many materials are togetherly found

Q3. (3) Both A and B

Q4. (1) Earth

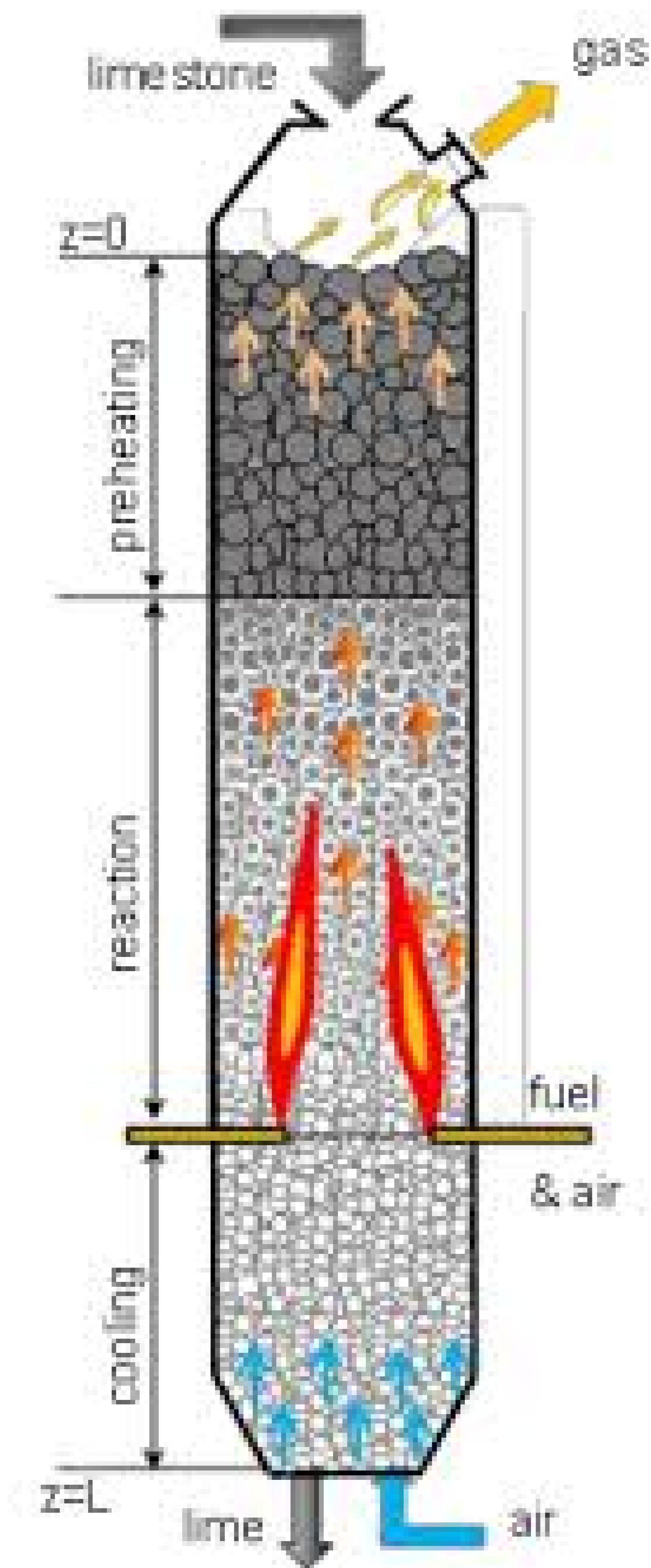
Q5. (4) Mercury

Passage - 3

5 Marks

Answer Key 3.4

Marks - 25



The metals in the middle of the activity series such as iron, zinc, lead, copper, are moderately reactive. These are usually present as sulphides or carbonates in nature. It is easier to obtain a metal from its oxide, as compared to its

sulphides and carbonates. Therefore, prior to reduction, the metal sulphides and carbonates must be converted into metal oxides. The sulphide ores are converted into oxides by heating strongly in the presence of excess air. This process is known as roasting. The carbonate ores are changed into oxides by heating strongly in limited air. This process is known as calcination.

Q1. (1) Oxide

Q2. (4) All of the above

Q3. (1) Calcination

Q4. (2) Reduction

Q5. (1) YES

Passage - 4

5 Marks

The metals high up in the reactivity series are very reactive. They cannot be obtained from their compounds by heating with carbon. For example, carbon cannot reduce the oxides of sodium, magnesium, calcium, aluminium, etc., to the respective metals. This is because these metals have more affinity for oxygen than carbon. These metals are obtained by electrolytic reduction. For example, sodium, magnesium and calcium are obtained by the 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).

Q1. (2) Negatively

Q2. (2) NO

Q3. (1) Positively

Q4. (4) All of the above

Q5. (4) All of the above

Passage - 5

5 Marks



Alloying is a very good method of improving the properties of a metal. Iron is the most widely used metal. But it is never used in its pure state. This is because pure iron is very soft and stretches easily when hot. But, if it is mixed with a small amount of carbon (about 0.05 %), it becomes hard and strong. When iron is mixed with nickel and chromium, we get stainless steel, which is hard and does not rust. Thus, if iron is mixed with some other substance, its properties change.

Q1. (1) YES

Answer Key 3.4

Marks - 25

Q2. (2) It becomes Hard and strong

Q3. (1) Mixture of nickel and chromium with iron

Q4. (1) Iron

Q5. (1) TRUE

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If one of the metals is mercury, then the alloy is known as an amalgam. The electrical conductivity and melting point of an alloy is less than that of pure metals. For example, brass, an alloy of copper and zinc (Cu and Zn), and bronze, an alloy of copper and tin (Cu and Sn), are not good conductors of electricity whereas copper is used for making electrical circuits. Solder, an alloy of lead and tin (Pb and Sn), has a low melting point and is used for welding electrical wires together

Q1. (1) Bad conductors

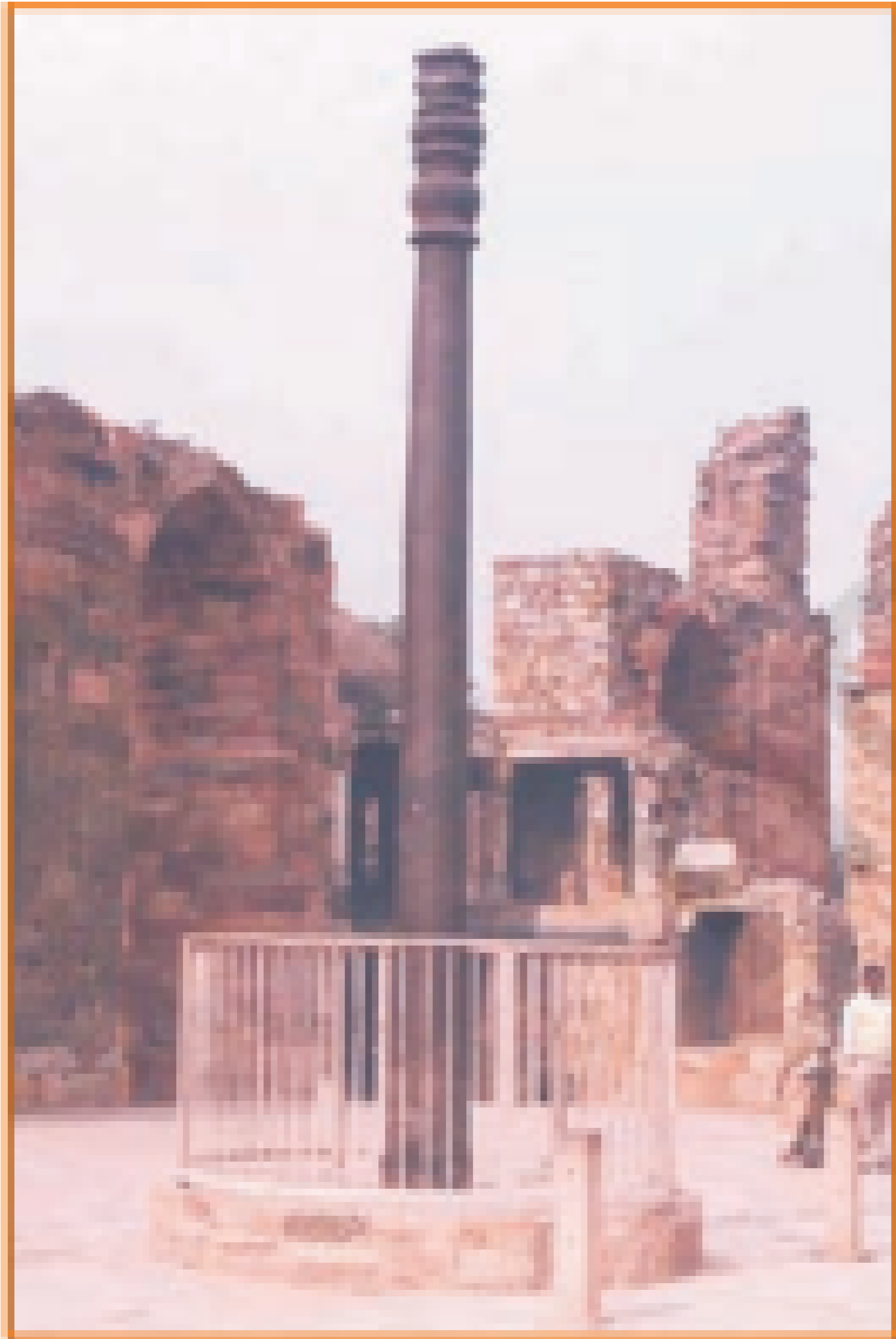
Q2. (2) Copper

Q3. (2) Alloy

Q4. (2) FALSE

Q5. (2) Bronze

Passage - 2**5 Marks**



Iron pillar at Delhi

The iron pillar near the Qutub Minar in Delhi was built more than 1600 years ago by the iron workers of India. They had developed a process which prevented iron from rusting. For its quality of rust resistance it has been examined by scientists from all parts of the world. The iron pillar is 8 m high and weighs 6 tonnes (6000 kg).

Q1. (1) Delhi

Q2. (2) NO

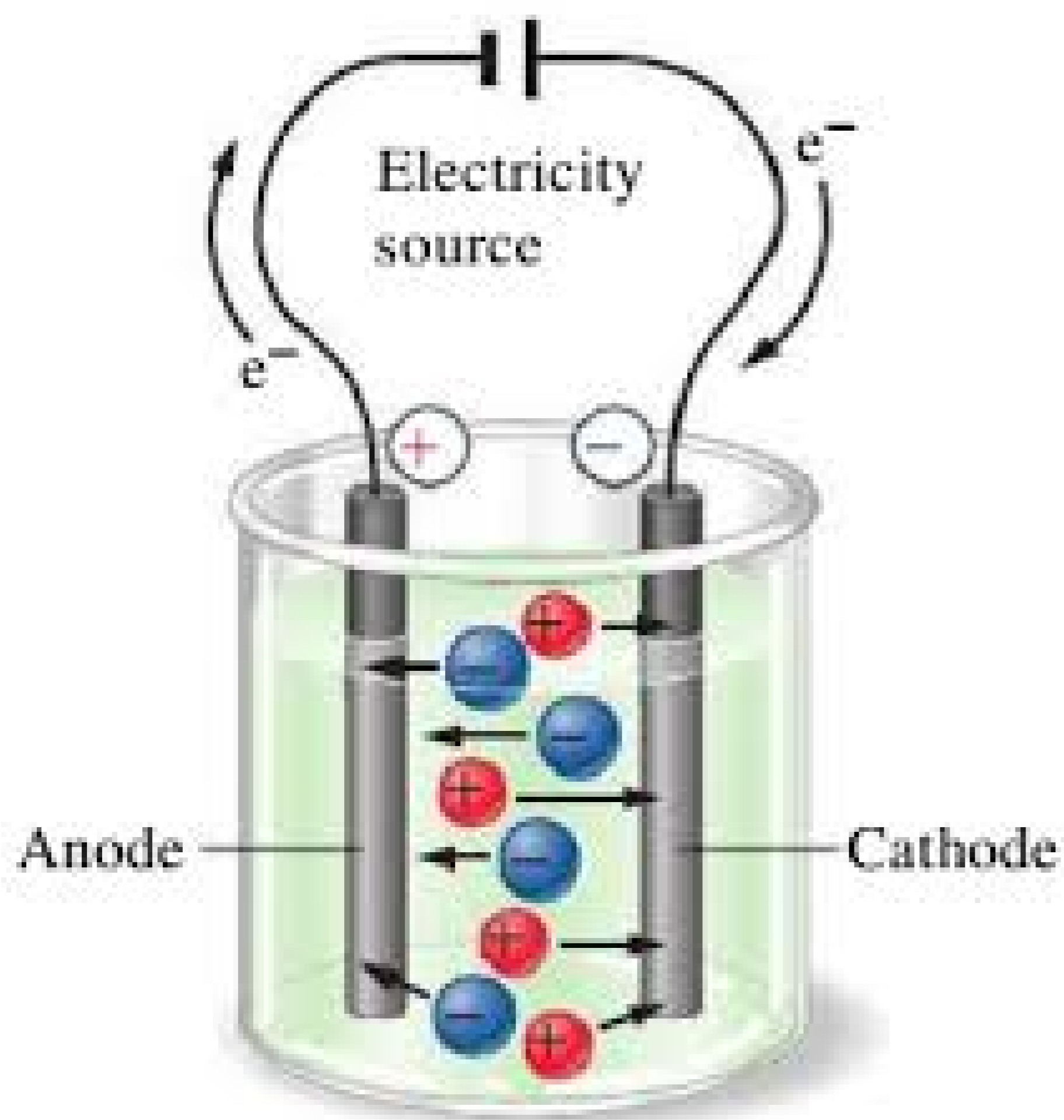
Q3. (3) 8m

Q4. (2) Galvanization

Q5. (2) $Fe_2O_3 \cdot n2H_2O$

Passage - 3

5 Marks



The conduction of electricity through a solution involves the movement of charged particles. A solution of an ionic compound in water contains ions, which move to the opposite electrodes when electricity is passed through the solution. Ionic compounds in the solid state do not conduct electricity because movement of ions in the solid is not possible due to their rigid structure. But ionic compounds conduct electricity in the molten state. This is possible in the molten state since the electrostatic forces of attraction between the oppositely charged ions are overcome due to the heat. Thus, the ions move freely and conduct electricity

Q1. (2) FALSE

Q2. (1) Freely

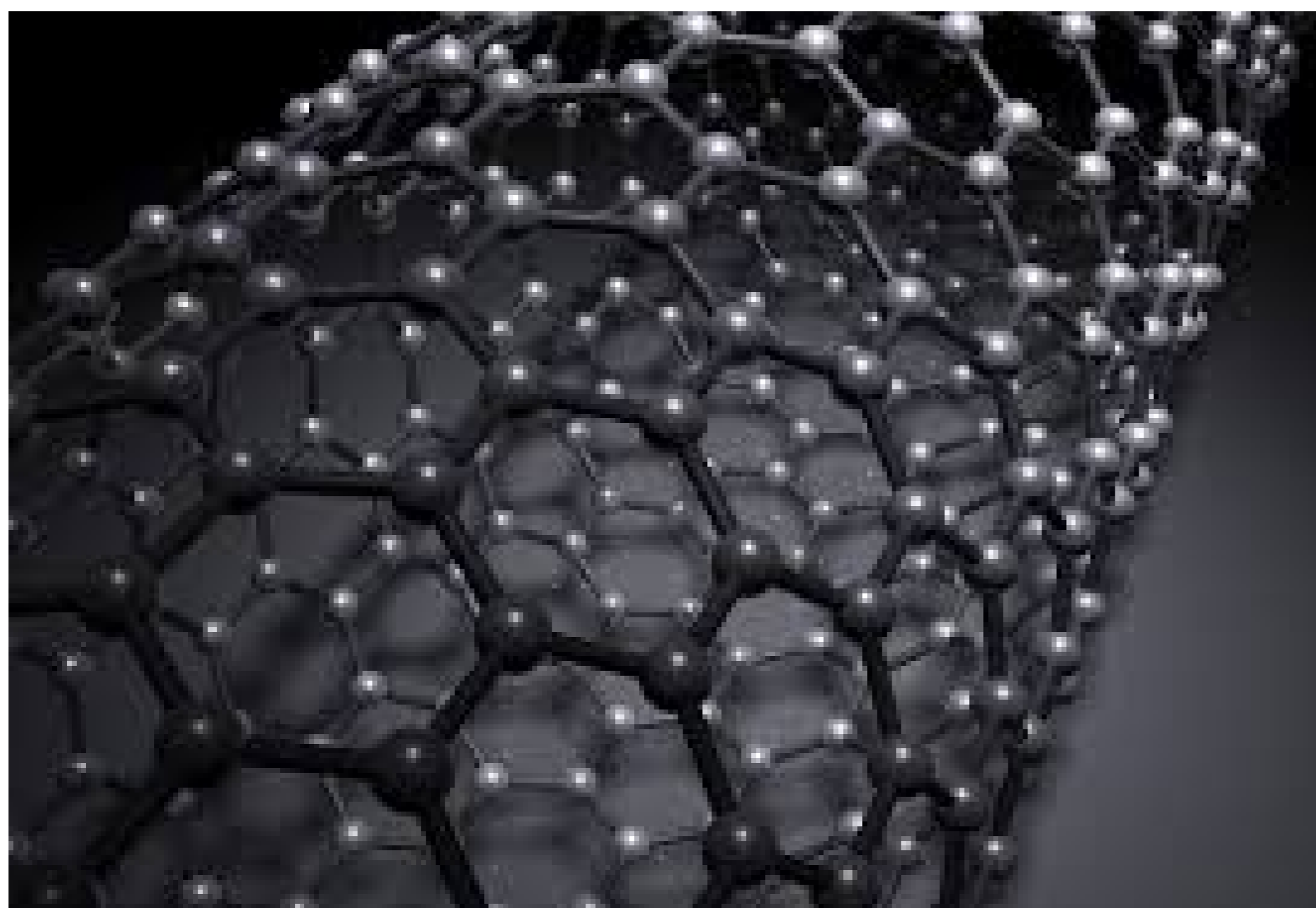
Q3. (2) Electrostatic

Q4. (1) TRUE

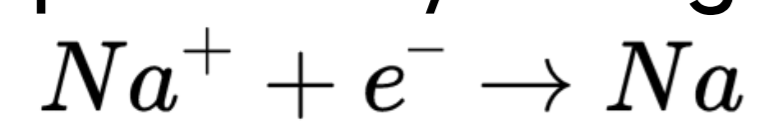
Q5. (2) Rigid state

Passage - 4

5 Marks



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At anode



Q1. (2) Carbon

Q2. (2) Negative

Q3. (4) All of the above

Q4. (2) Anode

Q5. (1) YES

Passage - 5

5 Marks

Different metals show different reactivities towards oxygen. Metals such as potassium and sodium 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 kerosene oil. At ordinary temperature, the surfaces of metals such as magnesium, aluminium, zinc, lead, etc., are covered with a thin layer of oxide. The protective oxide layer prevents the metal from further oxidation. Iron does not burn on heating but iron filings burn vigorously when sprinkled in the flame of the burner. Copper does not burn, but the hot metal is coated with a black coloured layer of copper(II) oxide. Silver and gold do not react with oxygen even at high temperatures

Q1. (2) Zinc

Q2. (4) Both A and B

Q3. (2) Oxidation

Q4. (2) Potassium

Q5. (2) NO
