(Q.) Define electrolysis. (1 Mark)

(**Ans**) The chemical reaction (decomposition) of an electrolyte (conducting liquid) into its componentswhen electricity is passed through it is called electrolysis.

(Q.) By which process, we can easily obtain gold ornaments at cheaper costs? (1 Mark)

(**Ans**) Electroplating is process of deposition of a layer of one metal over another metal by passing electric current through conducting liquids. So, gold-plated ornaments are prepared by electroplating gold over low cost metals like silver, aluminium, etc.

(Q.) What is current? (1 Mark)

(**Ans**) Flow of charges inside a conductor is called as current.

(Q.) Name two sources of electric current. (1 Mark)

(**Ans**) The two sources of electric current are given as follows:-
1. Voltaic cell.
2. Daniel cell.

(Q.) What happens when an electric current is passed through the copper sulphate solution? (1 Mark)

(**Ans**) When an electric current is passed through the copper sulphate solution, copper sulphate dissociates into copper and sulphate.

(Q.) What is meant by an electric circuit? (1 Mark)

(**Ans**) A closed and continuouspath through which electric current flows is called electric circuit.

(Q.) What is a battery? (1 Mark)

(**Ans**) The combination of two or more cells is called as battery.

(Q.) Which type of energy is converted into electrical energy in an electric cell? (1 Mark)

(**Ans**) In electric cell, chemical energy obtained from the chemical reactions of the conducting liquid and the electrodes, is converted into electrical energy.

(Q.) Which effect of electric current is utilized in electroplating? (1 Mark)

(**Ans**) Chemical effect of electric current is utilized in electroplating.

(Q.) Define electroplating. (1 Mark)

(**Ans**) It is process of deposition of a thin layer of one metal over another metal by passing electric current through conducting liquid i.e. electrolysis.

(Q.) Explain the term magnetic effects of an electric current. (2 Marks)

(**Ans**) When an electric current is passed through a wire, the current carrying wire behaves like a magnet. When a magnetic compass is brought near it, the needle shows deflection. This effect is called magnetic effect of electric current.

(Q.) Explain the term chemical effects of an electric current. (2 Marks)

(**Ans**) When an electric current is passed through a conductingliquid, chemical reactiontake place (like change in colour,etc). This effectis called chemical effects of an electric current.

(Q.) What is a conductor? Give two examples. (2 Marks)

(**Ans**) A conductor is made up of material which allows electric current to pass through it.
Examples
1. copper
2. Iron

(Q.) Why is an acid or an ionic salt added to water in the electrolysis of water? (2 Marks)

(**Ans**) Pure water or distilled water is a bad conductor of electricity whereas acids and bases are good conductor of electricity. When an acid orionic saltsare dissolved in distilled water then the resulting solutionconducts electricity.

(Q.) Give some applications of the chemical effect of current. (2 Marks)

(**Ans**) The chemical effect of current is used in
1.electroplating,
2.the extraction of metals,
3.the purification of metals , and
4.the productions of compounds.

(Q.) Solid sodium chloride does not conduct electricity while molten sodium chloride conducts. Explain why? (2 Marks)

(**Ans**) Solid sodium chloride does not conduct electricity because the particles (ions) are held together by strong forces of electrostatic attraction. In molten state the ions become free and move to conduct electricity, since on heating the bonds between ions become weak.

(Q.) State two applications of electrolysis. (2 Marks)

(**Ans**) Two applications are
1. Refining of metals.
2. Electroplating articles to look attractive.

(Q.) What is an insulator? Give two examples. (3 Marks)

(**Ans**) Materials, which do not allow electric current to pass through them, are called as insulator.
Examples
1. wood
2. rubber

(Q.) Define an electrode. Also define cathode and anode. (3 Marks)

(**Ans**) Electrodes are conductors which conduct electric current through a conducting liquid in an electric circuit
Cathode: The electrode, which is connected to the negative terminal of the battery or cell, is called cathode.
Anode: The electrode, which is connected to the positive terminal of the battery or cell is called anode.

(Q.) When tap water is used as a conducting liquid in the a closed electric circuit, the bulb glows. Why? (3 Marks)

(**Ans**) Tap water contains dissolved impurities which makes it a good conductor of electrictiy. So,when tap water is used as a conducting liquid in the a closed electric circuit, the bulb glows.

(Q.) Write some points that should be remember while electroplating. (3 Marks)

(**Ans**) The following points should be remember while electroplating:
1. The metal article on which electroplating is to be done is made the negative electrode (cathode), i.e. it is connected to the negative terminal of the battery.
2. The metal to be deposited is made the positive electrode (anode), i.e.it is connected to the positive terminal of the battery.

3. A water-soluble salt of the metal to be deposited is taken as the electrolyte (conducting liquid).

(Q.) Write some uses of electroplating. (3 Marks)

(**Ans**) An important use of electroplating is to protect the inner metal and at the same time give the object anattractive looks.
Some examples are as follows
1. The bumpers of car are chromium-plated to protect them from corrosion.
2. Water taps are plated with nickel or chromium for the same reason.
3. Iron plated with tin to prevent rusting.
4. A steel spoon is plated with silver for decoration.

(Q.) List the necessary conditions that help to ensure a smooth and firm deposit during electroplating. (3 Marks)

(**Ans**) The necessaryconditions to ensure a smooth and firm deposit are
1.a direct current should be used.
2.a small current should be applied for a longer time.
3. the surface of the article should be free from dirts like oil or grease.
4. appropriate temperature should be maintained during electrolysis.

(Q.) Give one term for
(i) the electrode through which current enters the electrolyte.
(ii) the electrode connected to the negative terminal of the battery.
(iii) Purifying metals by using electrolysis. (3 Marks)

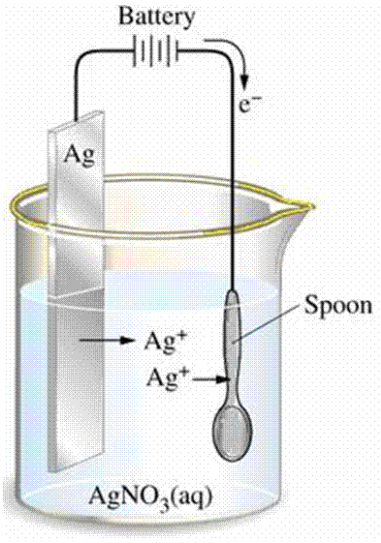
(**Ans**) (i) 'anode' as it is connected to the positive terminal of the battery.
(ii) 'cathode' as it is connected to thenegative terminal of the battery.
(iii) Refining of metals.

(Q.) Write some uses of electrolysis. (5 Marks)

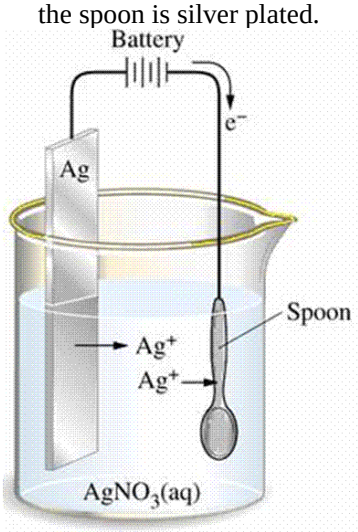
(**Ans**) Electrolysis can be used for
1. the extraction of metals from their ores.
2.refining certain metals such as copper and zinc.
3. the manufacture of chlorine. In submarines, oxygen produced by the electrolysis of water is used for breathing.
4. electroplating many things we use everyday.

(Q.) What is electroplating? How are steel spoons plated with silver? Explain with the help of diagram. (5 Marks)

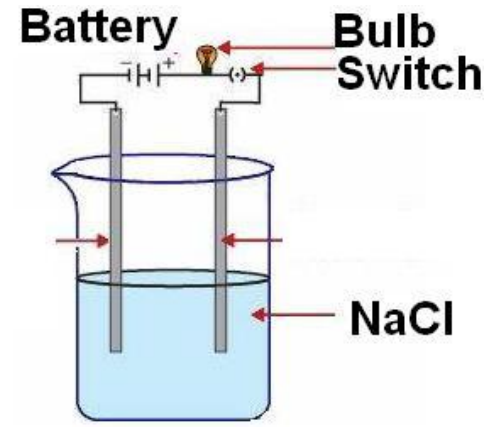
(**Ans**) The process of depositing a thin layer of a desired metal over another metal object with the help of electric current is called electroplating. For electroplating a steel spoon with silver, a solution of silver, i.e. $AgNO_3$ is taken as the electrolyte. The spoon and a pure silver bar are dipped into the electrolyte and connected to the negative and positive terminals of a battery respectively. When electric current is passed through the silver nitrate solution, it dissociates due to chemical effect of electric current. The positively charged silver ions move

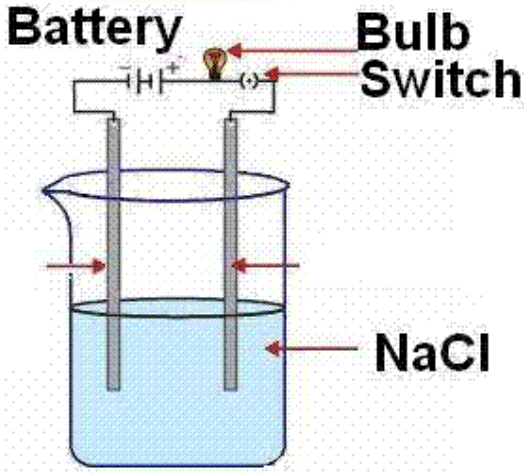


to the negative electrode (spoon) and form a deposit of silver on it and thus the spoon is silver plated.



(Q.) An experiment was set as shown below:





(i) Label the parts indicated by arrows in diagrams.

(ii) Will the bulb glow if the sodium chloride is in:

(a) solid state

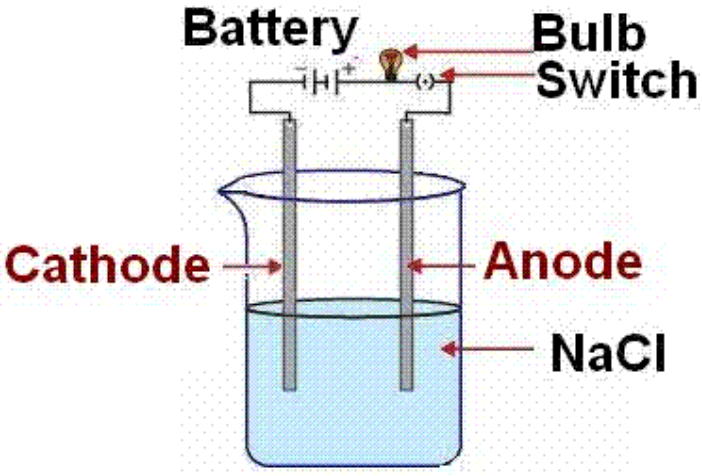
(b) molten state

(c) aqueous state

Explain your answer.

(5 Marks)

(**Ans**) (i) Anode and cathode.



(ii) (a) No, it will not glow.

In solid state the free particles (ions) are held together by strong forces of electrostatic attraction.

(b) Yes, it will glow.
In molten state it conduct electricity because the temperature required to melt compound weakens the bond between ions and ions become free to move.

(c) Yes, it will glow.
In aqueous state conduct electricity because dielectric effect of water weakens the bond between ions and ions become free to move.