

INTEXT QUESTION-ANSWERS

Questions

Q. 1. Why bulb does not glow even when liquid is conducting ?

Ans. It may be possible that the bulb does not light up even when the liquid is conducting. This happens when a weak current passes through the circuit, which cannot fully heat the filament of the bulb and therefore bulb will not glow fully.

Q. 2. Does the strength of current has any effect on the circuit ?

Ans. If the electric current in the closed circuit is weak, there is possibility that filament of the bulb may not glow, this happens because the filament has not attained the required temperature at which it glows due to the weak current flowing in the circuit.

Questions

Q. 1. How does a magnetic compass needle behave when a current carrying wire passes over it ?

Ans. When a current carrying wire is placed over a magnetic needle, the needle gets deflected because the current produces a magnetic field around the wire. This deflection is due to the interaction of the magnetic field produced around the wire and the magnetic needle.

Q. 2. What is a magnetic compass ?

Ans. **Magnetic Compass** : A magnetic compass is a device that has a magnetic needle that can rotate freely around a vertical axis in the horizontal plane. When it is placed on the surface of the earth, it points towards the north direction. It is used to find the correct direction.

TEXTBOOK EXERCISES (SOLVED)

(A) Fill in the Blanks

1. Metals are conductor of electricity.
2. Magnetic tester uses effect of current.
3. Electric tester useseffect of current.
4. An electrolyte dissociates into when direct current passes through it.

5. Copper and brass utensils are coated with metal.

Ans. 1. good, 2. magnetic, 3. heating, 4. constituents, 5. tin.

(B) Write True (T) or False (F)

1. Electric current does not flow through liquids.
2. Electroplating uses heating effects of current.

3. An electric tester is used to check if a wire or appliance carries current.
4. Artificial jewellery is costlier than gold jewellery.
5. Coating of chromium over iron is called galvanization.

Ans. 1. (F), 2. (F), 3. (T), 4. (F), 5. (F).

(C) Choose the Correct Answer

1. This is a good conductor of electricity :

(a) Bakelite (b) Rubber
(c) PVC (d) Graphite.

Ans. (d) Graphite.

2. Galvanisation is coating of this metal over iron :

(a) Gold (b) Silver

(D) Match Column 'A' with Column 'B'

| Column 'A' | Column 'B' |
|---|----------------------|
| 1. The flow of charge | (a) Chromium |
| 2. A source of current | (b) Electroplating |
| 3. Cycle handles are coated by this metal | (c) Galvanization |
| 4. Coating of superior metal over inferior metal using electric current | (d) Current |
| 5. Coating of zinc over iron sheets | (e) An Electric Cell |

Ans.

| Column 'A' | Column 'B' |
|---|----------------------|
| 1. The flow of charge | (d) Current |
| 2. A source of current | (e) An Electric Cell |
| 3. Cycle handles are coated by this metal | (a) Chromium |
| 4. Coating of superior metal over inferior metal using electric current | (b) Electroplating |
| 5. Coating of zinc over iron sheets | (c) Galvanization |

(c) Zinc (d) Mercury.
Ans. (c) Zinc.

3. Which liquid is not a good conductor of electricity ?

(a) Lemon juice
(b) Distilled water
(c) Common salt solution
(d) Copper sulphate solution.

Ans. (b) Distilled water.

4. It is based on chemical effects of electricity.

(a) Electroplating (b) Glowing of bulb
(c) Sublimation (d) Distillation.

Ans. (a) Electroplating.

5. Rims of vehicles are usually coated with :

(a) Gold (b) Silver
(c) Chromium (d) Copper.

Ans. (c) Chromium.

(E) Very Short Answer Type Questions

Q. 1. What is an LED ?

Ans. LED : It is a light emitting diode that emits light, when an electric current flows through it. It is used in place of light bulb when low current flows in the circuit

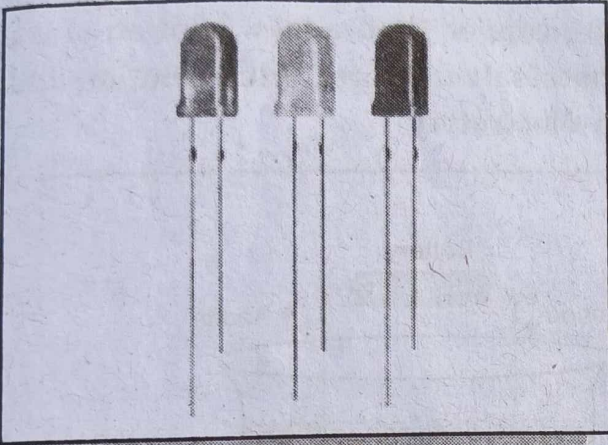


Fig. LED

because it can glow even with low current. It is a semiconductor device. Two wires are connected to it, one wire is slightly longer than the other wire and the longer wire is connected to the positive (+) terminal of the battery. LEDs are available in many colours and are very helpful in saving electricity.

Q. 2. Define electric current.

Ans. Electric Current : The rate of continuous flow of electric charge is called electric current. That is, the flow of electric charge in unit time is called electric current.

$$\text{Electric current (I)} = \frac{\text{Charge (Q)}}{\text{Time (t)}}$$

S.I. unit of electric current is ampere.

Q. 3. What is conductor ? Give examples.

Ans. Conductor : Material that allows electric current to pass through it is called conductors of electricity.

Example : Almost all metals like aluminium, copper and silver etc. are conductors of electricity.

Q. 4. Give two examples of electrolytes.

Ans. Electrolyte : The substances which break into ions (charged particles) when

dissolved in water are called electrolytes. Due to these ions, the solution becomes a conductor of electricity.

For example, when common salt (sodium chloride) is dissolved in water, it dissociates into sodium ion (Na^+) and chloride ion (Cl^-) which are liberated into the solution due to which the salt solution becomes a conductor of electricity.

Q. 5. Name the instrument used to detect current flowing through a wire.

Ans. A magnetic needle or an electrical tester is used to detect the current flowing through a wire.

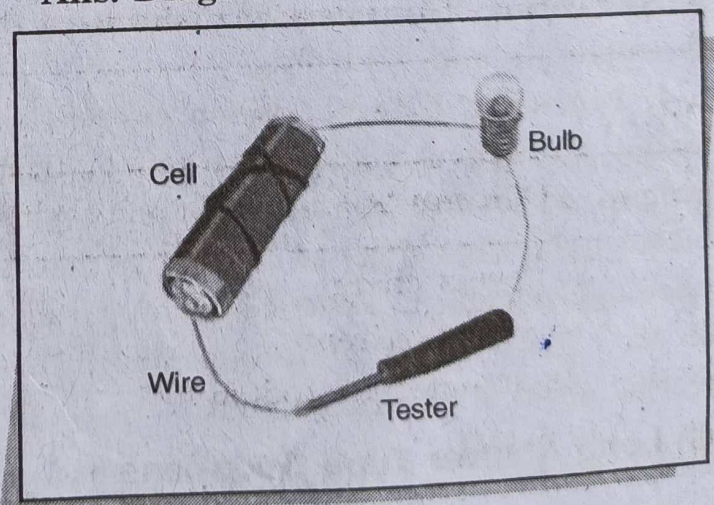
(F) Short Answer Type Questions

Q. 1. How can a pure water be made an electrolyte ?

Ans. Making distilled water electrolyte : Distilled water is pure water from which dissolved salts and other impurities have been removed. Pure water is obtained distillation process. By dissolving common salt (sodium chloride/ NaCl) in this distilled water, it becomes an electrolyte solution and now it becomes conducting and allows electric current to pass through it.

Q. 2. Draw a labelled diagram of an electric tester.

Ans. Diagram of Electric Tester :



Q. 3. Why do electricians wear rubber shoes and rubber gloves ?

Ans. Electricians wear rubber gloves and rubber shoes when repairing electrical

equipments connected in an electric circuit carrying current and also while touching live wires because rubber is a bad conductor of electricity which protects electricians from electric shock. It is because insulators do not allow electric current to pass through them.

Q. 4. Write some effects of electric current.

Ans. Effects of electric current : Mainly, electric current has the following effects :

1. Magnetic Effect, 2. Heating Effect,
3. Chemical Effect and 4. Lighting Effect.

1. Magnetic Effect : When electricity flows through a conducting (metal) wire, a magnetic field is produced around it. This effect of electric current is called magnetic effect. This effect is used in electric bell.

2. Heating Effect : When electricity flows through a copper coil, heat is produced through the coil. This is called the heating effect of electric current. This effect is used in Electric heater and Electric press.

3. Chemical Effect : When an electric current is passed through an electrolyte, the ions in it move towards the opposite electrode under the influence of current flowing in the solution. This effect of electric current is called chemical effect. This effect has been used in electroplating and electrolysis.

4. Lighting Effect : When current is passed through a conductor then it first becomes red hot and then white hot and begins to emit light. This effect of electric current is called lighting effect. Electric bulb on passing electric current emits white light due to the lighting effect of electric current.

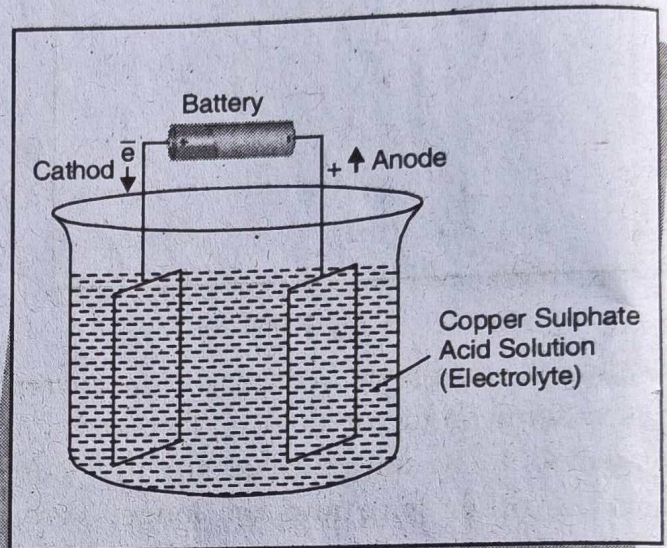
(G) Long Answer Type Questions

Q. 1. How are impure metals purified using electric current ? Explain using diagram.

Ans. The chemical effect of electric current

is used to obtain pure metal from impure metal, which is called electrolysis.

Method of Purification of Metals : Take a large glass beaker shaped vessel. Now dissolve the water soluble compound of that metal which we want to obtain in pure form. Suppose we want to get pure copper from impure copper then add a solution of copper sulphate salt in water. This solution will act as an electrolyte.



A thin plate of pure copper is used as the cathode (negative electrode) and a rod of impure copper is used as the anode (positive) electrode.

Now, on passing an electric current, the acidic solution of copper sulphate electrolyte gets decomposed into the copper ion (Cu^{++}) and sulphate ion (SO_4^{2-}). These Cu^{++} reach the Cu cathode and by gaining electrons become neutral Cu atoms, these atoms deposit on the Cu cathode, while (SO_4^{2-}) ions on reaching the anode forms copper sulphate which goes into the solution. Thus the anode gets corroded while the size of the cathode increases due to copper deposition. Other metallic impurities of the anode settle at the bottom of the vessel as sludge.

Q. 2. Write five uses of electroplating.
Ans. Uses of Electroplating :

1. By coating the inferior metal with a

superior metal, the metal can be protected from corrosion and rusting.

2. The process of extracting chromium from its ore is not economical. Therefore, a thin layer of chromium is coated on the metal object. Because chromium is a bright and non-corrosive metal and does not get scratched easily, chromium coated metal is used to make car parts, bath tubs, cooking gas burners etc.

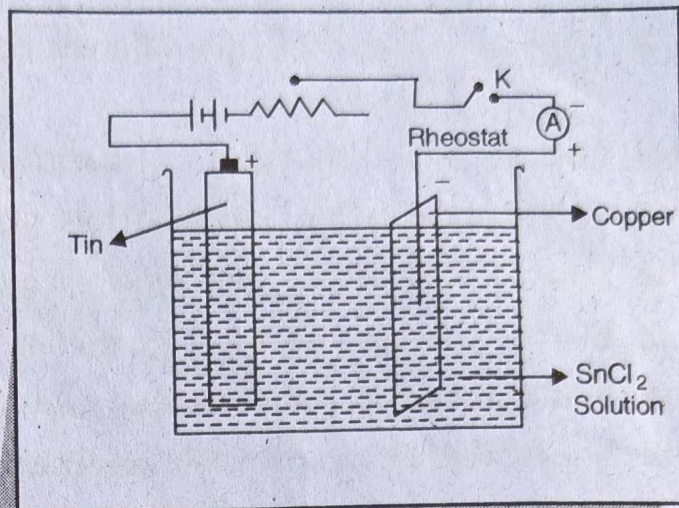
3. Artificial jewelry is obtained by coating gold on cheap metals such as copper.

4. Containers used for storing food items are obtained by coating tin metal on iron metal so that food items do not come in direct contact with iron and it avoids spoilage of stored food item.

5. Coating of Zinc on the iron by passing electricity is called Galvanization. By doing this, the iron is protected from rusting.

Q. 3. With the help of labelled diagram explain how a copper plate is electroplated by tin metal ?

Ans. Take a glass jar containing a solution of soluble salt of tin. Tin chloride (SnCl_2) Set up the electrical circuit as shown in the figure.



Now adjust the rheostat in such a way that the correct amount of current flows through the salt solution. A current of 1A (one ampere) is usually enough for electroplating an area of 100 cm^2 . Now connect the negative terminal of the battery to the copper plate on which Tin is to be coated and tin metal rod to the positive electrode (+ve) of the battery to form the anode and complete the circuit. Now close the circuit so that current starts flowing from the battery. Continue this process for 15-20 minutes. Due to current flow, tin ions will deposit on the copper plate and the solution will recover this deficiency of Tin from the anode. At the end of the process you will see that a layer of tin has been deposited on the copper plate. This is called tin electroplating.