

Multiple Choice Questions: Choose the most appropriate answer.

Q1. Electric current is the flow of particles with

- a) A negative charge
- b) a positive charge
- c) Both positive and negative charges flowing opposite to each other.
- d) Either positive or negative charges depending on the material.

Q2. Which of the following is not a conductor of electricity?

- a) tap water
- b) salt water
- c) petrol
- d) lime juice

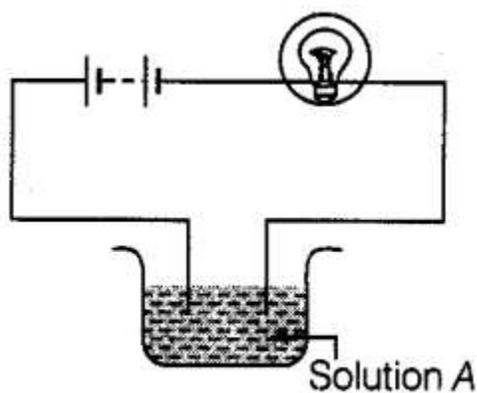
Q3. On passing electricity through copper sulphate solution,

- a) copper is formed at anode
- b) copper is formed at cathode
- c) oxygen is formed at anode
- d) hydrogen is formed at cathode

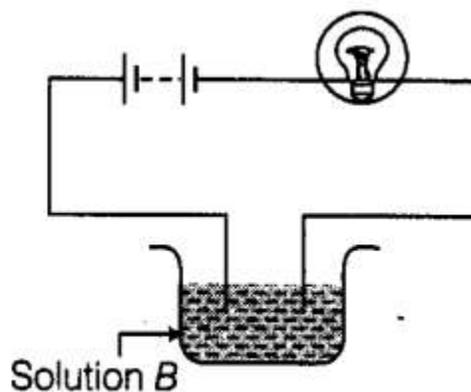
Q4. An electric current can produce

- a) heating effect only
- b) chemical effect only
- c) magnetic effect only
- d) chemical, heating, and magnetic effects.

Q5. Boojho and Paheli performed experiments taking similar bulbs and cells but two different solutions A and B as shown in figure



(A) Boojho's experiment



(B) Paheli's experiment

They found that the bulb in the setup A glows more brightly as compared to that of the setup B. You would conclude that

- a) higher current is flowing through the circuit in setup A.
- b) higher current is flowing through the circuit in setup B.
- c) Equal current is flowing through both the circuits.
- d) the current flowing through the circuits in the two setups cannot be compare in this manner.

Q6. When electric current is passed through a conducting solution, there is a change of colour of the solution. This indicates

- (a) the chemical effect of current
- (b) the heating effect of current
- (c) the magnetic effect of current
- (d) the lightning effect of current

Q7. Which one of the following solutions will not conduct electricity?

- (a) Lemon juice
- (b) Vinegar
- (c) Tap water
- (d) Vegetable oil

Q8. Which of the following metals is used in electroplating to make objects appear shining?

- (a) Iron
- (b) Copper
- (c) Chromium
- (d) Aluminium

Fill in the blanks.

Q1. The object to be electroplated is taken as.....electrode.

Q2. One of the most common applications of chemical effect of electric current is.....

Q3. Small amount of a mineral salt present naturally in water makes it a..... of electricity.

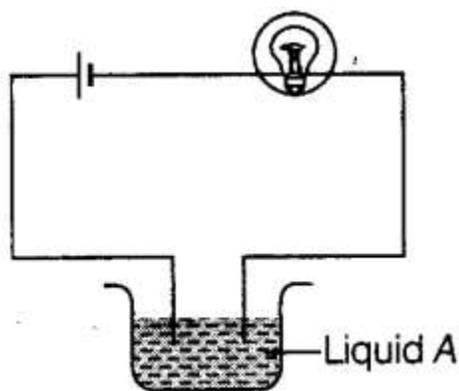
Q4. Electroplating of..... is done on objects like water taps and cycle bell to give them a shiny appearance.

Q5. A positively charged body has a(deficit / excess) of electrons.

Q6. Ions may be positively charged or negatively charged. True or False?

Very Short Answer.

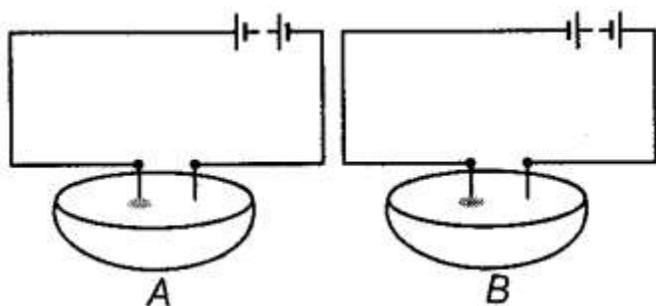
- Q1. Identify the Cathode(C), Anode(A) and Electrolyte(E) for Galvanization.
- Q2. Identify C, A and E for the coating of Cr on Ni.
- Q3. Identify C, A and E in the coating of silver on steel.
- Q4. Identify C, A and E in gold on silver.
- Q5. Does distilled water conduct electricity? What about tap water? Give reasons.
- Q6. Explain what happens, when salt is added to water and free ends of electrical wires are dipped in.
- Q7. List the changes that are seen in a solution, when electric current is passed through it.
- Q8. How will you electroplate a copper spoon with silver? Draw the circuit diagram.
- Q9. After doing Activity of electroplating a spoon with copper, a student interchanged the connections of the copper plate and the spoon. What do you think will happen now?
- Q10. Instead of taking the trouble of electroplating metals with chromium for making car parts, taps, cycle parts, etc. Why these objects are no made of chromium itself?
- Q11. Why is a layer of zinc coated over iron?
- Q12. Will the solution of sugar in distilled water conduct electricity?
- Q13. Paheli set up an experiment using liquid A in the beaker as shown in the figure. She observed that the bulb glows. Then, she replaced the liquid A by another liquid B. This time the bulb did not glow. Boojho suggested replacing the bulb by an LED. They observed that the LED glows. Explain.



Q14. Paheli wants to deposit silver on an iron spoon. She took silver nitrate (AgNO_3) solution in a beaker and set up a simple circuit for electroplating. Which terminal of the battery should the spoon be connected to? What material should the other electrode be made of?

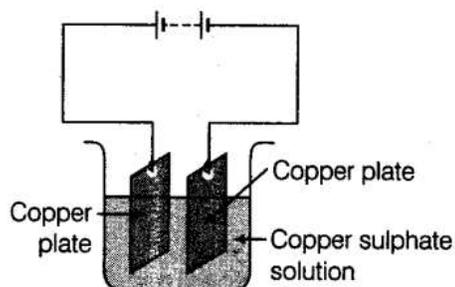
Q15. Why is tin electroplated on iron to make cans used for storing food?

Q16. Observe and tell which of these two circuits A or B shows the correct observation?

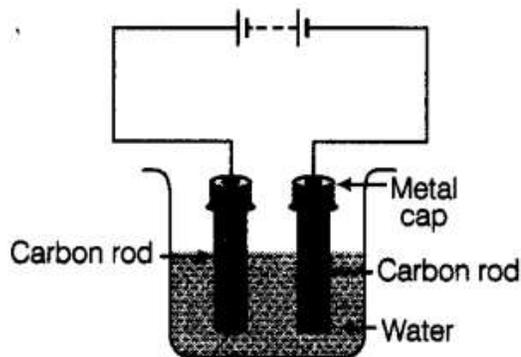


Q17. In the circuit given in the figure, Boojho observed that copper is deposited on the electrode connected to the negative terminal of the battery.

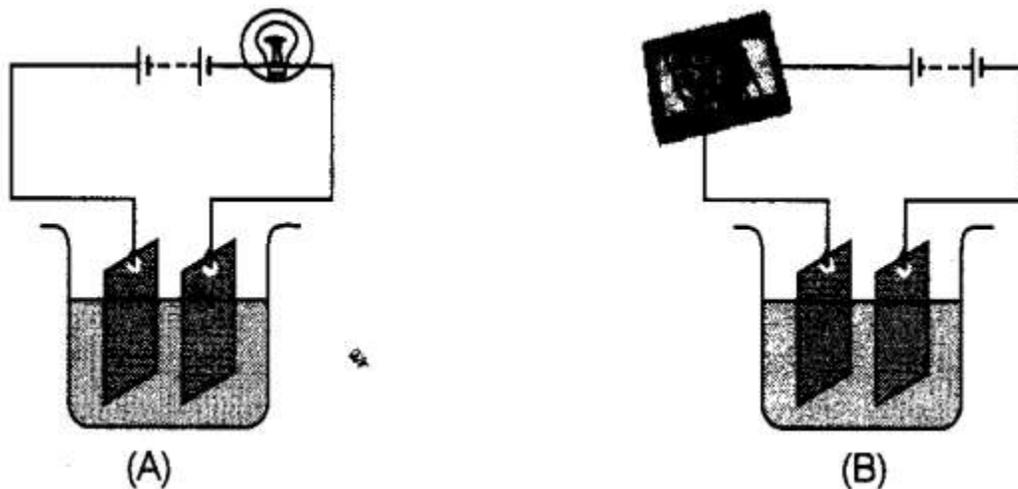
Paheli tried to repeat the same experiment. But she could find only one copper plate. Therefore, she took a carbon rod as negative electrode. Will copper be still deposited on the carbon rod? Explain your answer.



Q18. Boojho made the circuit as shown in the figure. He wanted to observe what happens when an electric current is passed through water. But he forgot to add a few drops of lemon juice to water. Will it make any difference to his observations? Explain



Q19. Observing that the bulb does not glow in the circuit shown in Fig. (A) Boojho changed the circuit as shown in Fig. (B). He observed deflection in the magnetic compass.



- What does the deflection in magnetic compass indicate?
- Why did the bulb not glow in Fig. (A)?
- What would be the effect of increase in the number of turns in the coil wound around the magnetic compass in Fig. (B)?
- What will be observed if the number of cells are increased in the circuit shown in Fig. (B)?

Answer

Multiple Choice Questions: Choose the most appropriate answer.

Q1. a) a negative charge.

Q2. c) petrol

Q3. b) copper is formed at cathode.

Q4. (d) When an electric current is passed through a conducting solution, it causes chemical reactions.

The resulting effect is called chemical effect of current.

When an electric current is passed through a bulb, its filament gets heated to a high temperature and bulb starts glowing. The resulting effect is heating effect of current. Whenever an electric current is passed through a circuit, a magnetic field is produced around it. The resulting effect is magnetic effect of current. Thus, an electric current can produce chemical, heating and magnetic effects.

Q5. (a) Bulb in the set up A glows more brightly because higher current is flowing through the circuit in set up A, as solution A is better conductor of electricity than that of B.

Q6. (a) The passage of an electric current through a conducting solution causes chemical reactions. As a result, change of colour of solution occurs. This indicates the chemical effect of current.

Q7. (d) Vegetable oil will not conduct electricity because it does not make ions easily.

Q8. (c) Chromium is used for electroplating to make objects appear shining because chromium has a shiny appearance and it resists scratches.

Fill in the blanks

Q1. **Negative** The object to be electroplated is taken as negative electrode or cathode, so that the free ions get deposited on it.

Q2. **Electroplating** It is the process of depositing a layer of any desired metal on another material by means of electricity.

Q3. **Good conductor** Small amount of a mineral salt present naturally in water makes it a salt solution,

therefore it becomes good conductor of electricity.

Q4. Chromium Because chromium has a shiny appearance, it resists scratches and does not corrode.

Q6. Deficit

Q7. True.

Very Short Answer.

Q1. Deposition of Zn on Fe

Cathode → Fe

Anode → Zn

Electrolyte → ZnSO_4 solution

Q2. C → Ni (Nickel)

A → Cr (Chromium)

E → $\text{Cr}_2(\text{SO}_4)_3$

Q3. C → Steel

A → Silver (Ag)

E → Ag_2SO_4

Q4. C → Ag (Silver)

A → Au (Gold)

E → $\text{Au}_2(\text{SO}_4)_3$

Q5. No. distilled water does not conduct electricity, as it does not contain any salts. Tap water, conducts electricity as it contains salts, and is thus a salt solution which is a good conductor of electricity.

Q6. Upon doing this, the solution becomes an electrolyte. Electrolysis occurs when electric current passes through the electrolyte.

When current flows through the electrolyte NaCl, it breaks into Na^+ and Cl^- . Here Na^+ is the Cation and Cl^- is the Anion. The Cation goes to the Cathode (negative electrode) and the Anion goes to the Anode. Hence, both the ions turn into neutral elements or molecules.

Q7. When electric current is passed through an electrolyte, electrolysis occurs.

- Gas bubbles are seen near the electrodes, indicating the emission of certain gases.
- Sometimes, some deposits are seen on the electrodes.
- A change in the colour of the solution may also be seen.

Q8. For this, we take distilled water, and set up the whole circuit with the wires and the battery. As the Cu (of the copper spoon) is the metal upon which silver is to be coated.

Therefore, the copper spoon should be connected to the negative terminal of the battery (cathode), and the silver should be connected to the positive terminal of the battery (anode).

We could then take a salt solution of silver (Silver Nitrate) as the Electrolyte.

Hence, when Electric Current is passed through the electrolyte, electrolysis occurs, and silver is deposited on the copper spoon, through the method of electroplating.

Q9. If a student interchanges between the copper wire and the spoon during electroplating, the copper ions deposited on the spoon will move back to their place of origin.

Q10. Different metals have different properties and on the basis of these properties they are used. Chromium is only used for electroplating metals in order to increase their life span. Besides this, chromium is expensive. So, instead of making the whole item with chromium, a layer of chromium is only added to lend a lustrous look to the item.

Q11. Layer of zinc is coated over iron because zinc prevents it from rust and corrosion.

Q12. No, the solution of sugar in distilled water is a poor conductor of electricity and therefore current cannot pass through it.

Q13. Liquid B was a weaker electrolyte than liquid A. The current through Liquid B could be weak and therefore was unable to make the bulb glow. However, it was strong enough for the LED to glow. Since LED required less electricity to glow.

Q14. Spoon should be connected to the negative terminal of the battery. The other electrode should be made of silver, so that silver ions get deposited on an iron spoon.

Q15. Electroplating of tin is done on the iron to make cans used for storing food because tin is less reactive than iron. Coating of tin prevents food from coming in contact with iron and thus, prevents it from getting spoiled.

Q16. It is not clear from the diagram that what is A and B. So, we cannot predict the actual solution. But if we compare with NCERT activity, this seems to be a potato and the correct diagram is A because positive terminal makes the greenish blue spot on the potato, due to the chemical effect of current in potato.

Q17. Yes, copper from the copper sulphate solution will be deposited on the carbon rod. But she should keep the carbon rod on the cathode (-ve). Copper from the copper plate will be dissolved into the copper sulphate solution for electroplating.

Q18. If the water is distilled water and lemon juice is not added, no current will pass through the circuit. If the water taken is salty, then a feeble current will pass through the circuit and bubbles will be seen on the negative electrode.

Q19.

(i) It indicates the presence of current in the circuit.

(ii) The bulb did not glow because the current was not sufficient to make it glow.

(iii) Deflection in the magnetic compass will increase.

(iv) Deflection in the compass will increase further.