INDIAN SCHOOL AL WADI AL KABIR

CLASS: VIII	**DEPARTMENT: SCIENCE-2025-26**	**DATE 19/10/2025**
TEXTBOOK- Q &A WITH ANSWERS	**TOPIC: ELECTRICITY: MAGNETIC AND HEATING EFFECTS**	**NOTE: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SECTION:**	**ROLL NO.**

1. Fill in the blanks:

(i) The solution used in a Voltaic cell is called _____.

(ii) A current carrying coil behaves like a _____.

Answers:

1. Electrolyte

2. Magnet

2. Choose the correct option:
(i) Dry cells are less portable compared to Voltaic cells. (True/False)
(ii) A coil becomes an electromagnet only when an electric current flows through it. (True/False)
(iii) An electromagnet, using a single cell, attracts more iron paper clips than the same electromagnet with a battery of 2 cells. (True/False)

Answer:
(i) False (Voltaic cells are less portable due to the liquid electrolyte.)
(ii) True
(iii) False (A stronger current of battery current of 2 cells makes the coil a stronger magnet.)

3. An electric current flows through a nichrome wire for a short time.
(i) The wire becomes warm.
(ii) A magnetic compass placed below the wire is deflected.
Choose the correct option:
(a) Only (i) is correct
(b) Only (ii) is correct
(c) Both (i) and (ii) are correct

(d) Both (i) and (ii) are not correct

4. Match the items in Column A with those in Column B.

Column A	Column B
(i) Voltaic Cell	(a) Best suited for an electric heater
(ii) Electric iron	(b) Works on the magnetic effect of electric current
(iii) Nichrome wire	(c) Works on the heating effect of electric current
(iv) Electromagnet	(d) Generates electricity by chemical reactions

Answer: (i)- (d), (ii)- (c), (iii)- (a), (iv)- (b)

5. Nichrome wire is commonly used in electrical heating devices because it

(i) is a good conductor of electricity.

(ii) generates more heat for a given current.

(iii) is cheaper than copper.

(iv) is an insulator of electricity.

6. Electric heating devices (like an electric heater or a stove) are often considered more convenient than traditional heating methods (like burning firewood or charcoal). Give reason(s) to support this statement, consider societal impact.

Ans: Traditional methods like burning firewood or charcoal are not convenient because:

(i) More space in the household is required to store dry firewood or charcoal.

(ii) The smoke arising from the burning of firewood or charcoal is a health hazard. It gives a burning sensation to the eyes and makes breathing difficult.

(iii) The burning of firewood or charcoal releases harmful gases like carbon dioxide and carbon monoxide. These gases pollute the air we breathe and, therefore, are not good for our environment.

Electric heating devices, like an electric heater or stove, are more convenient as they need less space and do not cause pollution.

7. Look at the Figure. If the compass is placed near the coil deflects:

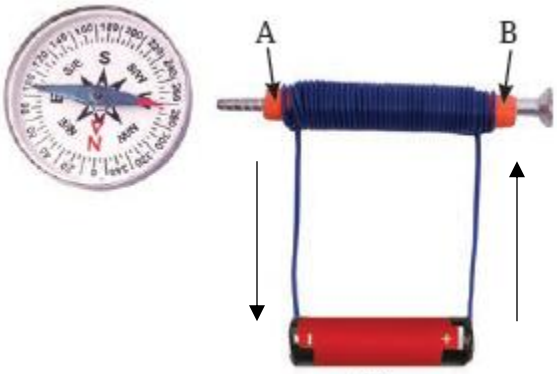
(a)

(i) Draw an arrow on the diagram to show the path of the electric current.

(ii) Explain why the compass needle moves when current flows.

(iii) Predict what would happen to the deflection if you reverse the battery terminals.

Ans: (i) The current flows from the positive terminal of the cell to end marked B of the coil, then through the coil to end marked A, and then to the negative terminal of the cell as shown by the red arrows in the Figure.



(a)

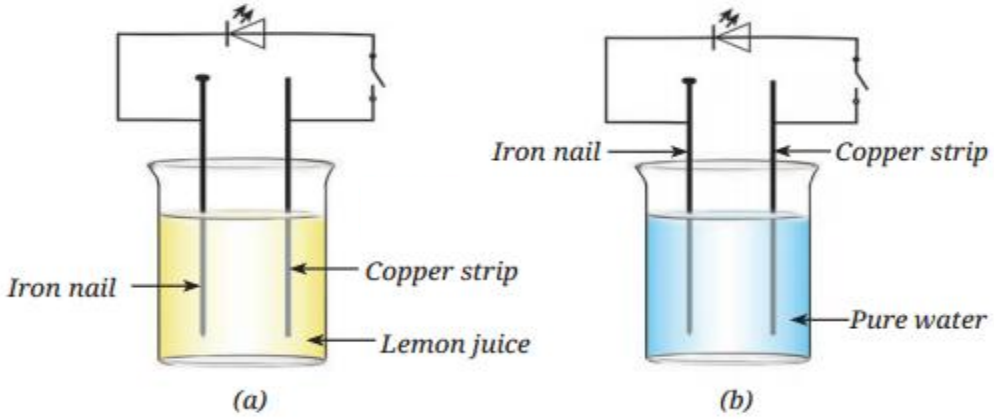
(ii) The compass needle moves as the coil becomes a magnet on passing the current through it, and the compass needle in its magnetic field moves.

(iii) When we reverse the battery terminals, the poles of the coil electromagnet change. Therefore, the deflection in the compass needle also changes accordingly. The pole of the compass needle that was earlier attracted to the coil will move away from it, and the other pole of the compass needle will get attracted towards the coil.

8. Suppose Sumana forgets to move the switch of her lifting electromagnet model to the OFF position (in the introduction story). After some time, the iron nail no longer picks up the iron paper clips, but the wire wrapped around the iron nail is still warm. Why did the lifting electromagnet stop lifting the clips? Give possible reasons.

Ans: The cell or battery has become weak or exhausted, so it cannot make the electromagnet strong. A conducting coil becomes a magnet only when an electric current is flowing through it (magnetic effect of electric current). When the flow of electric current is stopped, the coil loses its magnetic effect. The heating effect of electric current converts a part of the electric energy to heat energy. This heat energy makes the current-carrying wire warm. When the current stops flowing, the heating effect of the electric current stops, but the wire that has become warm takes some time before cooling to the normal temperature.

9. In Figure (below), in which case, the LED will glow when the switch is closed?

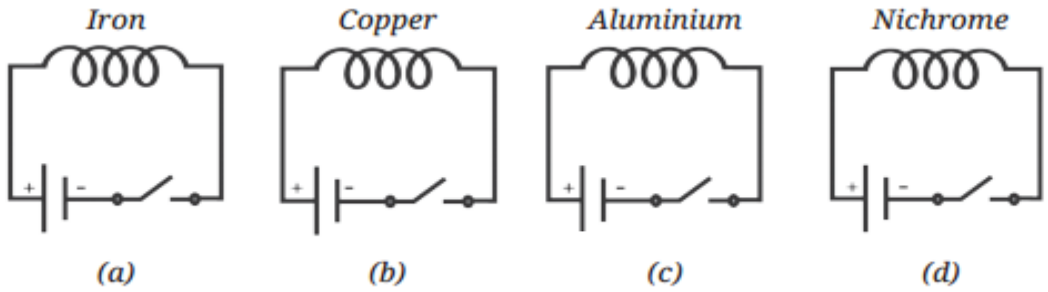


Ans: The LED will glow when the switch is closed in case of (a). Here, the electrolyte is the lemon juice. Copper and iron plates properly placed in a weak acid or salt solution and connected in a circuit produce electricity. In case of (b), the liquid used is pure water that does not become an electrolyte.

10. Neha keeps the coil the same way as in Activity 4.4, but slides the iron nail out, leaving only the coiled wire. Will the coil still deflect the compass? If yes, will the deflection be more or less than before?

Ans: Yes, the coil will deflect the compass even after the iron nail has been slid out. The coil gets a magnetic force when current flows through it. If an iron nail is inserted inside the coil, the strength of the magnet increases. Deflection in the compass will be less when Neha slides the iron nail out, due to a weaker electromagnet formed by the coil alone.

11. We have four coils, of similar shape and size, made up from iron, copper, aluminium, and nichrome, as shown in the Figure:



When current is passed through the coils, the compass needles placed near the coils will show deflection.

(i) Only in circuit (a)

(ii) Only in circuits (a) and (b)

(iii) Only in circuits (a), (b), and (c)

(iv) In all four circuits

Ans: The compass needles placed near the coils will show deflection in all four cases. The deflection, however, will not be equal in all four cases. The magnetic strength of the electromagnet depends on the nature of the material used. Some magnetic substances like iron, nickel, and cobalt make strong electromagnets, while aluminium and nichrome may be of the same shape and size may not make equally strong magnets. Therefore, the deflection of the compass needles will vary depending on the strength of the electromagnet.

EXTRA QUESTION

1. What is the difference between the electrolyte used in a dry cell and the one used in a Voltaic cell?

Ans: In a dry cell, the outer shell made of zinc contains the chemicals in the form of a thick, moist paste, which serves as the electrolyte. The electrolyte in a Voltaic cell is a liquid.

Prepared by: *Ms Shruti Mukundan*	*Checked by:* *HOD Science*