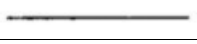
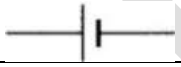
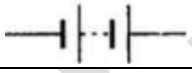
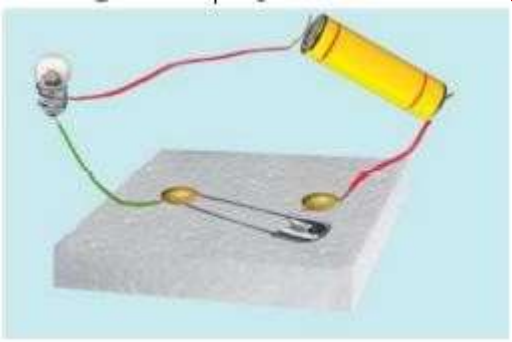
Electric Current and Its Effects

Q1. Draw in your notebook the symbols to represent the following components of electrical circuits. Connecting wires, switch in the OFF position, bulb, cell, switch in ON position and battery.

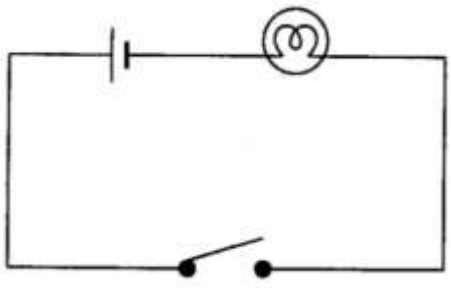
Sol:

Connecting wires	
Switch in the OFF position	
Bulb	
Cell	
Switch in ON position	
Battery	

Q2. Draw the circuit diagram to represent the circuit shown in Fig.

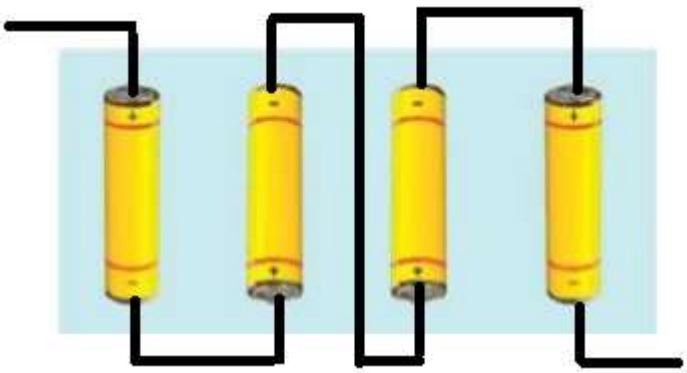


Sol:

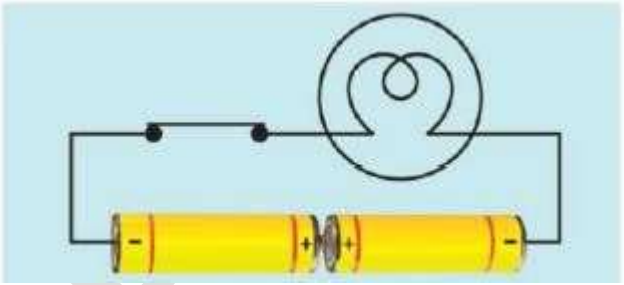


Q3. Fig. Shows four cells fixed on a board. Draw lines to indicate how you will connect their terminals with wires to make a battery of four cells.

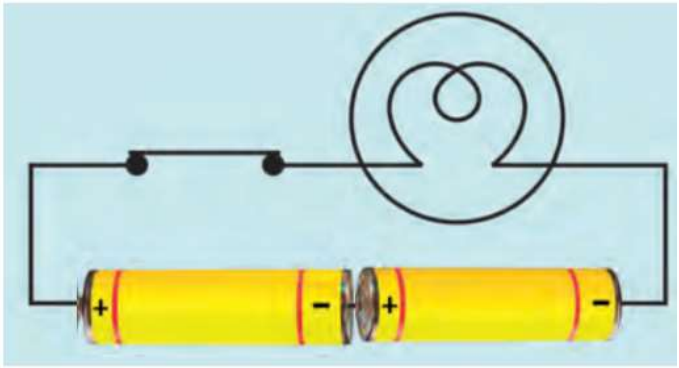
Sol:



Q4. The bulb in the circuit shown in Fig. does not glow. Can you indicate the problem? Make necessary changes in the circuit to make the bulb glow.



Sol: The problem in circuit is the combination of two cells. In given circuit, both the negative terminals are connected to the bulb. To resolve this problem positive terminal of one cell should be connected with negative terminal pf other to make the bulb glow.



Q5. Name any two effects of electric current.

Sol: Two effect of electric current are:

(i) Heating effect (Ex. Electric Bulb, Toaster)

(ii) Magnetic effect (Ex. Electric Motor, Generator)

Q6. When the current is switched on through a wire, a compass needle kept nearby gets deflected from its north-south position. Explain.

Sol: When the current flows through a wire, magnetic field is produced around it. Due to this magnetic fields, deflection is seen in the needle of magnetic compass. This effect of electric current is called magnetic effect of electric current.

Q7. Will the compass needle show the deflection when the switch in the circuit shown by Fig. is closed?

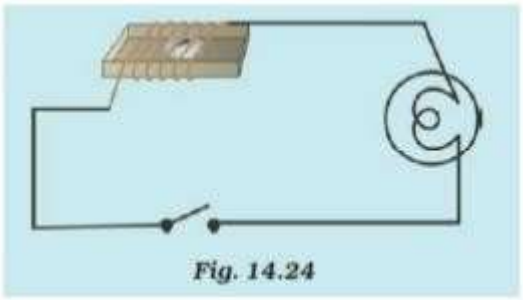


Fig. 14.24

Sol: No, because there is no battery as a sources of electric current and magnetic field is not produced in the circuit until battery is not connected.

Q8. Fill in the blanks

(a) Longer line in the symbol represents its---------- terminal.

(b) The combination of two or more cell is called ---------- --.

(c) When a current is switched ON in a room heater, it ----------.

(d) The safety device based on the heating effect of electric current is called --.

Sol: Fill in the blanks

(a) Longer line in the symbol represents its **Positive** terminal.

(b) The combination of two or more cell is called **Battery**.

(c) When a current is switched ON in a room heater, it **becomes red hot and emits heat**.

(d) The safety device based on the heating effect of electric current is called **Fuse.**

Q9. Mark 'T" if the statement is true and 'F' if it is false:

(e) To make a battery of two cells, the negative terminal of one cell is connected to the negative terminal of other cell. (T/F)

(f) When the current through the fuse exceeds a certain limit, the fuse wire melts and breaks. (T/F)

(g) An electromagnet does not attract a piece of iron. (T/F)

(h) An electric bell has an electromagnet. (T/F)

Sol: Mark 'T" if the statement is true and 'F' if it is false:

(a) To make a battery of two cells, the negative terminal of one cell is connected to the negative terminal of other cell. (F)

(b) When the current through the fuse exceeds a certain limit, the fuse wire melts and breaks. (T)

(c) An electromagnet does not attract a piece of iron. (F)

(d) An electric bell has an electromagnet. (T)

Q10. Do you think an electromagnet can be used for separating plastic bags from a garbage heap? Explain.

Sol: No, This method cannot be used for separating plastic bags from a garbage because electromagnets attract only the magnetic material like iron, nickel and cobalt. Plastic bags do not get attracted by the electromagnet.

Q11. An electrician is carrying out some repairs in your house. He wants to replace a fuse by a piece of wire. Would you agree? Give reasons for your response.

Sol: If an electrician is carrying out some repairs in our house. He wants to replace a fuse by a piece of wire. We would not agree for replacing the fuse with metal piece because it could be dangerous as fuse wire have very low melting point. In case of any piece of wire, the melting point will be high and our house circuit will be not prevented in case of overloading or overheating.

Q12. Zubeda made an electric circuit using a cell holder shown in Fig., a switch and a bulb. When she put she switch in the ON position, the bulb did not glow. Help Zubeda in identifying the possible defects in the circuit.

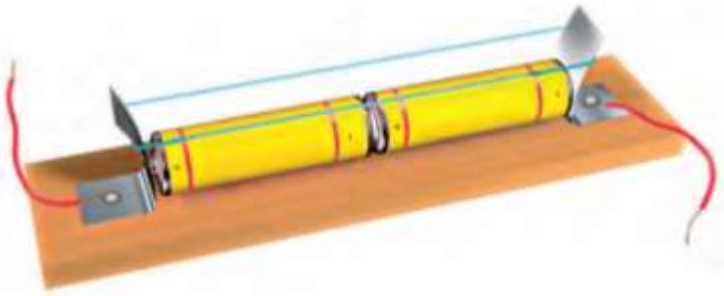


Fig. A cell holder

Sol: The possible reasons of defect in the circuit so that the bulb is not glowing:

(i) Cells should be connected in proper manner i.e. positive terminal of the first cell should be connected with negative terminals of other.
(ii) Connecting wire may be loose.
(iii) The cells are used up.
(iv) Bulb may be fused.

If zubeda will take care of these things then the bulb will certainly glow.

Q13. In the circuit shown in Fig.

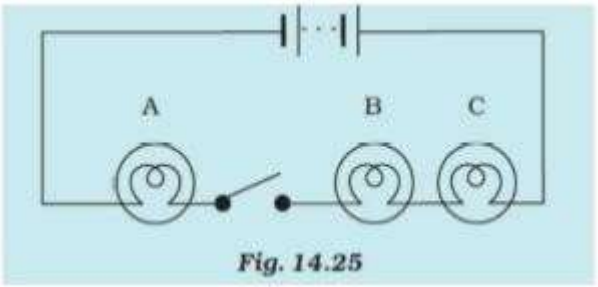


Fig. 14.25

(i) Would any of bulb will glow when the switch is in the 'OFF' position?
(ii) What will be the order in which bulb A, B, C will glow when switch is moved to the 'ON' position?

Sol:

(i) No, any of bulb will not glow when the switch is in the 'OFF' position as the circuit is not complete.
(ii) All the three bulbs glow simultaneously if switch is in ON position.