

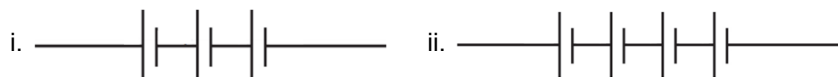
Chapter: 4

Q.1 Answer the following

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- 1 Electric cells having 2V potential difference each have been connected in the form of a battery. What will be the total potential difference of the battery in both cases?

Ans



- a. In the above case, the potential difference will be 6V as there are three cells of 2V connected in series with one another. ($2V + 2V + 2V = 6V$)
b. In the above case, the potential difference will be 8V as there are four cells of 2V connected in series with one another. ($2V + 2V + 2V + 2V = 8V$)

- 2 Write proper words from the following group of words in the blanks.
(magnetism, 4.5V, 3.0V, gravitational attraction, potential difference, potential, higher, lower, 0V)

- Water in the waterfall flows from a higher level to the lower level because of
- In an electric circuit, electrons flow from a point of potential to the point of potential.
- The difference between the electrostatic potential of the positive end and the negative end of an electric cell is the of the cell.
- Three electric cells of potential difference 1.5 V each have been connected as a battery. The potential difference of the battery will be V.
- An electric current flowing in a wire creates around the wire.

Ans 1. Water in the waterfall flows from a higher level to the lower level because of **potential**.

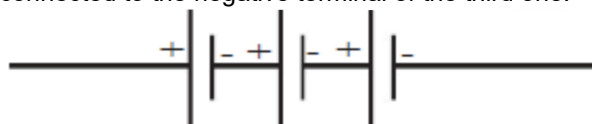
- In an electric circuit, electrons flow from a point of **higher** potential to the point of **lower** potential.
- The difference between the electrostatic potential of the positive end and the negative end of an electric cell is the **potential difference** of the cell.
- Three electric cells of potential difference 1.5 V each have been connected as a battery. The potential difference of the battery will be **4-4.5 V**.
- An electric current flowing in a wire creates **magnetism** around the wire.

- 3 A battery is formed by joining 3 dry cells with connecting wires. Show how will you connect the wires by drawing a diagram.

Ans i. Connection of cells in a series is known as a battery of cells.

In an electric circuit, one electric cell is connected to another in series such that the positive terminal of one

- ii. cell is connected to the negative terminal of second cell and the positive terminal of the second terminal is connected to the negative terminal of the third one.



- 4 In an electric circuit, a battery and a bulb have been connected and the battery consists of two cells of equal potential difference. If the bulb is not glowing, then which tests will you perform in order to find out the reason for the bulb not glowing?

Ans i. In an electric circuit, if the bulb and battery are connected then the current flows through the circuit and the bulb glows

- ii. If the bulb does not glow there might be three possibilities why the bulb is not glowing.

- The plug key may not be connected properly or switched on. So that needs to be checked if the connection are done correctly and the key is switched on.
- The bulb may be faulty or the filament of the bulb may be broken and hence the bulb needs to be

replaced.

- c. The third possibility may be that the terminals of the battery are not connected properly and hence no current is flowing through the circuit. For example: the negative terminal of one cell should be connected to the positive terminal of the other cell so that the potential difference is maintained and the current flows through the circuit.

Q.2 Answer the following in detail

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- 1** Describe the construction and working of an electric bell with the help of a diagram.

Ans * Electric bell is based on the principle of electromagnetism.

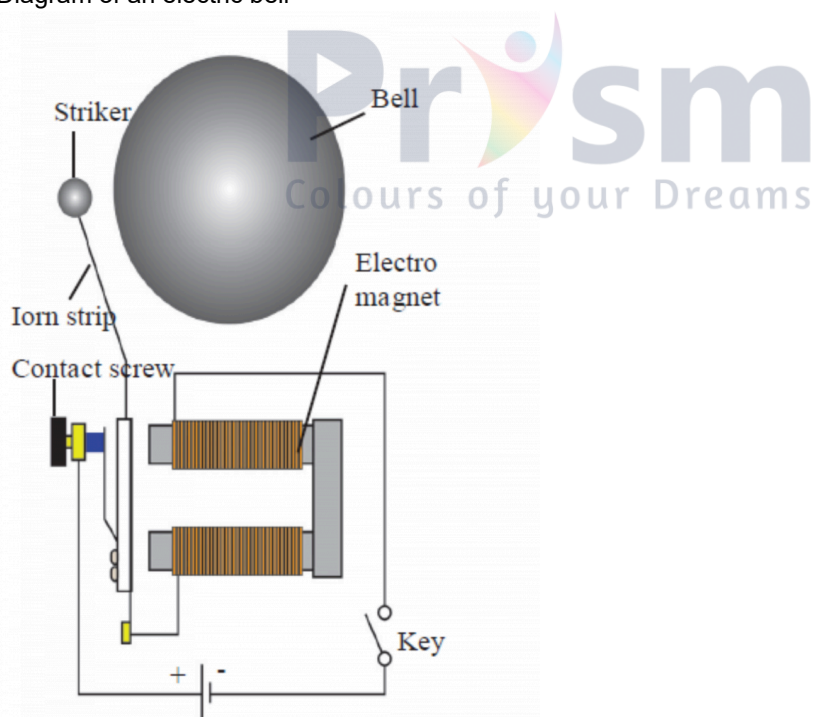
1 Construction of an electric bell

- A copper wire is wound around an iron piece. This coil acts as an electromagnet.
- An iron strip along with a striker is fitted near to the electromagnet.
- A contact screw is in touch with the strip.
- The electric circuit is connected as shown in the diagram.

2 Working of an electric bell

- The current flows in the circuit when screw is in contact with the strip, and hence the coil becomes a magnet and attracts the iron strip towards it.
- Therefore, the striker hits the gong and the sound is created.
- However at the same time, the contact screw loses the contact with the strip and the current in the circuit stops.
- In this situation, the electromagnet loses its magnetism and the iron strip moves back and comes in contact with the contact screw.
- The electric current is then immediately restored and again the striker hits the gong by the above process.
- This action repeats itself and the bell rings.

* Diagram of an electric bell



- 2** Describe the construction, working and usefulness of a dry cell with the help of a diagram.

Ans 1. Construction of a dry cell

- The dry cell consists of a whitish metal layer of Zinc. This layer acts as the negative terminal of the cell.
- There is another layer inside. An electrolyte is filled between these two layers.
- The electrolyte contains negatively and positively charged ions. These are the carriers of electricity.
- The electrolyte is a wet pulp of Zinc chloride (ZnCl_2) and Ammonium chloride (NH_4Cl).
- There is a graphite rod at the centre of the cell. This is positive terminal of the cell.
- A paste of Manganese dioxide (MnO_2) is filled outside the rod.

2. Working of the cell

- Due to the chemical reactions of all the chemicals in the cell, electric charge is produced on the two

terminals (graphite rod and zinc layer) and electric current flows in the circuit.

ii. Due to the wet pulp used in the cell, the chemical reaction proceeds very slowly.

iii. Hence a large electric current cannot be obtained from this cell.

3. Usefulness of dry cell

i. Dry cells have longer shelf life than electric cells using liquids.

ii. Dry cells are convenient to use as these can be held in any direction with respect to ground.

iii. Dry cells can be used in mobile instruments.

vi. Dry cells are used in radio sets, wall clocks and torches. These are available in 3-4 sizes.

* Diagram

