(On request – Nicol)

Q- A dry cell (battery) does 7.12 J of work through chemical energy to transfer 5.92 C of charge between the terminals of the cell. What is the electric potential difference between the two terminals?

Definition: Electro motive force (EMF) of a source of current is the amount of work done per unit charge to flow it through the circuit.

Thus EMF of the battery is given by

$$\varepsilon = \frac{W}{q} = \frac{7.12}{5.92} = 1.20 \ V$$

Now if the battery is in open circuit (no current through it) the potential difference between the terminals will be equal to the EMF i.e. 1.20 volts.

If the battery is in close circuit i.e. current is drawn from it, the potential difference across the terminals will be less than 1.20 volts and it will depend on the internal resistance and current in the circuit.