# Current and Voltage : W.S.-10

Use the equations :      $I = Q/t$      and          $V = E/Q = W/Q$

1) A cloud has a potential of $4.3 \times 10^6$ V. A charge of 15 C is transferred to the ground during a lightning strike.

   a) Find the energy transferred.

   b) Find the current if the time for the strike was 0.20 s.

2) A battery does 180 J of work on 12 C of charge. Find the voltage.

3) If 15 µC of electrons move in a wire in a time of 0.050 s, find the current.

4) The current in a heater is 9.0 A. The voltage is 120 V.

   a) Find the charge transferred in 1.0 minute.

   b) Find the energy delivered in 1.0 minute.

5) A 12 volt car battery can supply a current of 65 A for 1.0 hour. How much energy can it supply?

6) Find the time required to transfer 9.1 µC of charge with a current of $2.8 \times 10^{-6}$ A.

7) Find the charge transferred if 6.0 mA flows in a circuit for 15 minutes.

8) How much energy does a 9.0 volt battery supply to 5.2 C of charge?

9) A power supply operates at 120 V.

   a) Find the energy supplied per coulomb.

   b) Find the energy supplied per electron.

10) A 12 volt car battery is rated at 95 amp-hours. This means that it will operate at 12 volts for one hour while delivering a continuous current of 95 amps.

a) Find the total charge that the battery will deliver.

b) Find the total energy that is stored in the battery.

c) For how many hours will the battery operate if the current drawn is 0.62A?

Answers : 1)a) $6.5 \times 10^7$ J, b) 75 A, 2) 15 V, 3) $3.0 \times 10^{-4}$ A, 4)a) 540 C, b) $6.5 \times 10^4$ J, 5) $2.8 \times 10^6$ J, 6) 3.3 s, 7) 5.4 C, 8) 47 J, 9)a) 120 J, b) $1.9 \times 10^{-17}$ J, 10)a) $3.4 \times 10^5$ C, b) $4.1 \times 10^6$ J, c) 150 h.