



ELECTRIC POWER CALCULATIONS

1. A bulb uses energy at a rate of 48W on a 12V supply. Calculate:
 - (i) the current in the lamp.
 - (ii) the resistance of the lamp

2. An electric heater is operated on a 240V a.c mains supply is rated at 1500W. Calculate
 - (i) the current used by the heater
 - (ii) energy given out by the heater in 12 hours
 - (iii) the cost of running the heater for 12 hours if the cost per kWh is 850/=.

3. An electric bulb is marked 40W,220V. Another bulb is marked 40W,110V. Calculate the ratio of their resistances.

4. A battery of emf 10V and negligible internal resistance is connected to resistors R_1 , R_2 and R_3 of resistances 6 Ω ,4 Ω and 2.6 Ω respectively as shown in the figure above.
 - (i) calculate the effective resistance of the circuit.
 - (ii) Find the rate at which electrical energy is converted to heat energy in R_3

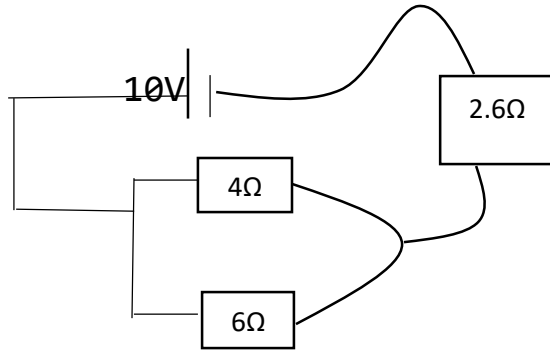


Figure 1

5. Four identical cells each of internal resistance 0.2Ω are connected in series to form a battery. Three identical bulbs each marked $3W$ and a 10Ω resistor are connected to the battery as shown in the figure 2 below. If the current through each lamp is $0.5A$, find

- (i) the resistance of each lamp.
- (ii) the reading of the voltmeter
- (iii) the effective resistance in the circuit.
- (iv) the energy delivered by the battery per second.

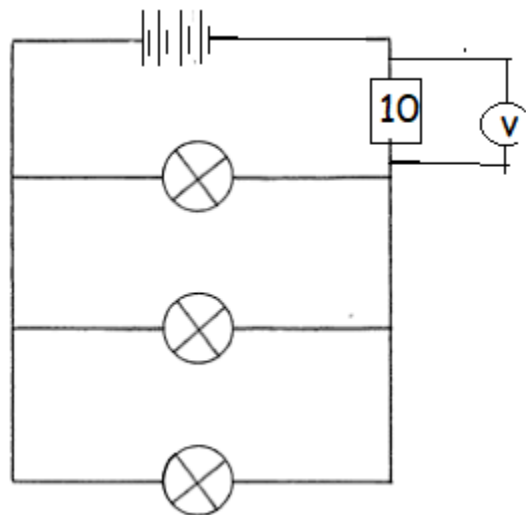


Figure 2