Electric Work and Power

1. A generator transfers 1.0 C of charge through a potential difference of 110 V.
   a. What work does the generator do? *(110 J)*
   b. What is the potential energy of 1.0 C of charge after the transfer? *(110 J)*
2. What work is done by the chemical energy of a dry cell to transfer 5.0 C of negative charge from its positive plate to its negative plate? The dry cell is rated at 1.5 V. *(7.5 J)*
3. How much work does the chemical energy of a 90 V battery do to transfer 30 C of charge between its plates? (*$2.7 \times 10^3 J$*)
4. A generator transfers 50 C of charge through a potential difference of 110 V.
   a. What work does the generator do to transfer this charge? (*$5.5 \times 10^3 J$*)
   b. The generator accomplishes this work in 5.0 s. How much work does it do per second? (*$1.1 \times 10^3 J/s$*)
   c. What power does the generator deliver in watts? (*$1.1 \times 10^3 W$*)
   d. What is the power of the generator in kilowatts? *(1.1 kW)*
5. The current through a light bulb connected across the terminals of a 120 V outlet is 0.50 A. At what rate does the bulb use electric energy? *(60 W)*
6. A 90 V battery causes a current of 2.0 A to flow through a lamp. What is the power of the lamp? *(180 W)*
7. A toaster connected to a 120 V source uses 4.0 A of current. What power does the toaster use? *(480 W)*
8. A light bulb uses 1.2 A when connected across a 120 V source. What is the wattage of the bulb? *(144 W)*