

Homework 4

6. Convert the following to kilowatts:

- a. $1,000\text{W} = \mathbf{1kW}$
- b. $3,750\text{W} = \mathbf{3.75kW}$
- c. $160\text{W} = \mathbf{0.16kW}$
- d. $50,000\text{W} = \mathbf{50kW}$

7. Convert the following to MegaWatts:

- a. $1,000,000\text{W} = \mathbf{1MW}$
- b. $3.6 * 10^6\text{W} = \mathbf{3.6MW}$
- c. $15 * 10^7\text{W} = \mathbf{150MW}$
- d. $8,700\text{kW} = \mathbf{8.7MW}$

8. Convert the following to milliwatts:

- a. $1\text{W} = \mathbf{1,000mW}$
- b. $0.4\text{W} = \mathbf{400mW}$
- c. $0.002\text{W} = \mathbf{2mW}$
- d. $0.0125\text{W} = \mathbf{12.5mW}$

12. If a 300W bulb is allowed to burn continuously for 30 days, how many kilowatt hours of energy does it consume?

$$24\text{hr} * 30 \text{ days} == 720\text{hrs}$$

$$300\text{W} * 720\text{hrs} == 216000\text{W} == 216\text{kWh}$$

216kWh 17. If a 75V source is supplying 2A to a load, what is the resistance value of the load? $R=V/I$, $R=75/2$ **$R=37.5 \text{ Ohms}$**

20. What is the power when there are 500mA of current through a 4.7kOhm resistor? $E=IR$, $E=(500\text{mA})(4.7\text{kOhm})=2350\text{V}$, $P=VI$, $P=(2350\text{V})(500\text{mA})= 1175\text{W}$, $P=(I^2)(R)$, $P=(.5\text{A}^2)(4700)=1175\text{W}$
1175W

21. If there are 60V across a 680 Ohm resistor, what is the power? $P=(V^2)/(R)$, $P=(60\text{V}^2)/(680 \text{ Ohm})= \sim 5.3\text{W}$ **5.3W**

22. A 6.8kOhm resistor has burned out in a circuit. You must replace it with another resistor with the same resistance value. If the resistor carries 10mA, what should its power rating be? Assume that you have available resistors in all the standard power ratings. $P=(I^2)(R)$, $P=(0.010^2)(6800)= 680\text{mW}$ **You will need a 1W resistor power rating, since 680mW > 1/2W resistor power rating**

23. For each circuit in figure 4-14, assign the proper polarity for the voltage drop across the resistor (See attached diagram, Dr. A.)

24. A 50 Ohm load uses 1W of power. What is the output voltage of the power supply? $I=\sqrt{P/R}$, $I=\sqrt{1/50}=0.1414$, $I= 141\text{mA}$,

$$V=P/I, \quad V=1/0.1414=\sim 7.07V \quad \mathbf{7.07V}$$

25. How much average current can be drawn from an 80Ah battery for 20h?
 $80\text{Ah}/20\text{h} = 4A \quad \mathbf{4A}$