**ELET 131 FALL 2013**

HomeWork_#4

10/02/2013

1. A $100\Omega$ resistor is connected across a 12V battery.
a. How many joules of energy will it dissipate in 1 minute?

b. If the resistor is left connected for 2 minutes instead of 1 minute, will the energy used increase? Will t dissipation level increase?

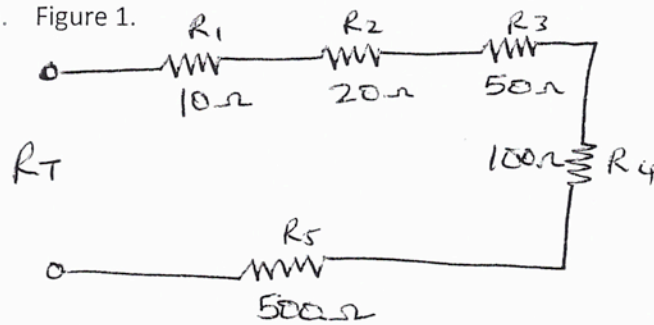2. How long can a 1500W heater be on before using more than 12kW of energy?

3. What is the efficiency of a motor that has an output of 0.5hp with an input of 410W?

4. A stereo system draws 1.8A of current at 120V. the audio output power is 50W
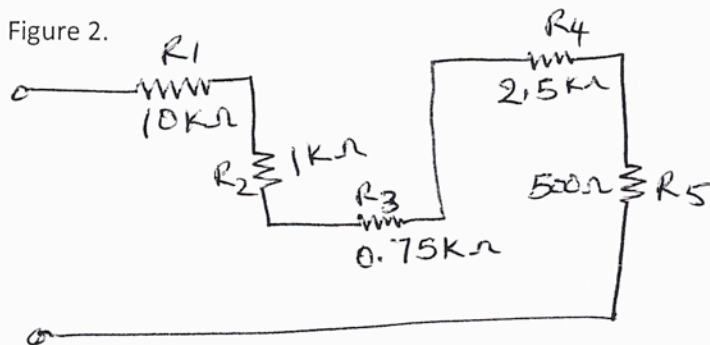a. How much power is lost in the form of heat in the system?

b. What is the efficiency of the system?

5. Find the total resistance $R_T$ for each configuration shown.

a. Figure 1.

$R_1$  $R_2$  $R_3$

$10\Omega$    $20\Omega$    $50\Omega$

$R_T$    $100\Omega \lessgtr R_4$

$R_5$

$500\Omega$

b. Figure 2.

$R_4$

$R_1$

$10K\Omega$    $2.5K\Omega$

$R_2 \lessgtr 1K\Omega$

$R_3$    $500\Omega \lessgtr R_5$

$0.75K\Omega$

c. Figure 3.

$R_1$    $R_x$

$205\Omega$    $1K\Omega$

$415\Omega \lessgtr R_2$

$R_3$

$220\Omega$