3. How many coloumbs of charge do 50 x 10^31 possess? 8 x 10^13
4. How many coloumbs of charge does it take to make 80 microcoloumbs of charge? (8 x 10^-5)/(1.6 x $10^{-19)=5x10}$14 electrons
5. Five hundred joules of energy are used to move 100C of charge through a resistor. What is the voltage across the resistor? V = W / Q = 500J/100C = 5V
6. How much energy does a 12V battery use to move 2.5C through a circuit? V = W/Q W = VQ 12 x 2.5 = 30J
7. A certain current source provides 100mA to a 1k Ohm load. If the resistance is decreased to 500 ohms, what is the current in the load?

.1A 1000 Ohms V=IR

.1x1000=100= Voltage= 100V

I=V/R 100/500=.2A = 200mA

21. (And 22) Determine the resistance values and tolerance for the following 4-band resistors:

a. red, violet, orange, gold: 27 x 10^3 +- 5% = 27k Ohm +- 5% = 25650 (Min) to 28350 Ohms (Max)
b. brown, gray, red, silver: 18 x 10^2 +- 10% = 1.8k Ohm +- 10% = 1620 (Min) to 1980 Ohms (Max)
c. brown, red, brown, gold: 12 x 10^1 +- 5% = 120 Ohm +- 5% = 114 (min) to 126 Ohms (Max)
d. orange, blue, red, silver: 36 x 10^2 +- 10% = 3.6k Ohm +- 10% = 3240 (min) to 3960 Ohms (Max)

23. Determine the color bands for each of the following 4 band, 5% values: 330 ohm, 2.2kOhm, 56kOhm, 100kOhm, and 39kOhm

a. Orange Orange Red Gold
b. Red Red Red Gold
c. Green Blue Orange Gold
d. Brown Black Yellow Gold
e. Orange White Orange Gold

41. Show the placement of an ammeter and a voltmeter to measure the current and the source voltage in figure 2-70