### **Introduction to circuit analysis**

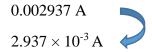
*Homework 1 – Introduction to electrical notation:* 

# YOU HAVE TO SHOW ALL WORK IN ORDER TO RECEIVE FULL CREDIT

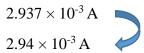
## **Prefixes and Engineering notation**

1. Express the following values in engineering notation rounded off to the <u>hundredth decimal place</u>, and use the metric prefixes associated with each engineering notation.

Template:



Step 1) Convert to engineering notation



Step 2) Rounded off to the hundredth decimal place

$$2.94 \times 10^{-3} \,\text{A}$$
 2.94 × m A

Step 3) Replace the power of ten with its respective prefix

a. 0.18 W =	b. 63518200 Ω =
c. 85219 Hz =	d. 0.000610752 F =
e. 0.0760832 s =	f. 16070282600 B =

2. Conversion between metric prefixes in engineering notation. Round off the answer to the <u>tenth decimal</u> <u>place</u>. For this exercise, omit engineering notation expression

a. 0.920626 m → mm =	b. 0.000230599 mF → nF =
c. 26150 μA → mA =	d. 0.0192555 MHz → kHz =
e. 3120500 mW → kW =	

#### Unit of measurements

The answer for question 3 and 4 must be in engineering notation rounded off to the tenth decimal place

For question 3 and 4, use the following conversion scale:

1 km = 1000 m 1 m = 39.37 in 1 m = 3.28 ft 12 in = 1 ft 5280 ft = 1 mi

3. The speed limit on China National Highways is 80 km per hour (km/h). If you are traveling 53 miles per hour (mph), would you pass the China National Highways' limit? Justify your answer using calculation

4. (Extra points) Usain Bolt, a Jamaican retired sprinter and world record holder in the 100 meters, 200 meters and 4 × 100 meters relay, has an average speed of 23.35 mph. If he runs at this speed in an 80-meter race, in the course of 5 seconds, how many meters he has completed of the race?

Hint:  $speed = \frac{Distance}{time}$ 

5.	The coolest reported temperature in the planet Mars is -125 $^{0}$ C. What would be this temperature in Fahrenheit and Kelvin? $^{0}$ F

Solving for an unknown variable

6. 
$$17 + 7x = 5(x - 6) + 33$$

7. 
$$\frac{1}{10}(k+11) = -2(8-k)$$

$$k =$$

# Equation in Engineering Technology with unknown variables

The answer for question 8 and 9 must be in engineering notation rounded off to the **hundredth decimal place** 

8. Given the voltage formula:  $V = \frac{W}{Q}$ , where V is the voltage between two points, in volts, W is the amount of energy, in Joules, needed to move a negative charge Q, in Coulombs, from one point to the other point. Find the energy expended moving a charge of 120.52  $\mu$ C between two points if the voltage between the points is 1.2 V.

9. The current formula is given to be:  $I = \frac{Q}{t}$ , where I is the current in Amperes, Q is the charge in Coulomb, and t is time in second. How many coulombs of charge pass through a lamp in 2.3 minutes if the current is constant at 18.5 mA? Hint: 1 minute = 60 seconds

------ Homework ends here ------