Student's Name:

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 **hundredth decimal place**, and use the metric prefixes associated with each engineering notation.
   Template:

   0.002937 A

   2.937×10^{-3} A Step 1) Convert to engineering notation

   2.937×10^{-3} A

   2.94×10^{-3} A Step 2) Rounded off to the hundredth decimal place

   2.94×10^{-3} A

   $2.94 \times$ 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 **tenth decimal place**. 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 _____ ^{0}K _____

Solving for an unknown variable

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

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 µC 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** ----------