

Student's Name:

Introduction to circuit analysis

Homework 1 – Introduction to Electrical Notation and Technical Math

Instructions:

- You have to show all work in order to receive full credit
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Prefixes and Engineering notation

1. Express the following values in engineering notation, use the metric prefixes associated with each engineering notation, and round off the answer to the hundredth place. (3.5 points each)

a. 0.0000000308822 F	b. 82036 Ω
c. 6327300 Hz	d. 0.26 W
e. 0.000500749 V	f. 16792.55 m

2. Conversion between metric prefixes in engineering notation. Round off the answer to the tenth place. (3.5 points each)

a. 2180555 mW \rightarrow kW	b. 86310 μ A \rightarrow mA
c. 0.065272 m \rightarrow mm	d. 0.000310599 mF \rightarrow nF
e. 0.0281555 MHz \rightarrow kHz	f. 35648200 ps \rightarrow μ s

Round off your answer to the tenth places, engineering notation

3. On 13 September 2012 the World Meteorological Organization announced that the highest recorded temperature in the World was measured on 10 July 1913 at Greenland Ranch, Death Valley, California, USA, with 58°C. What would be that temperature in Fahrenheit and Kelvin? (5 points)

1 km = 1000 m
1 mile = 1609.34 meters
12 in = 1 ft
5280 ft = 1 mile

4. The speed limit on highways in Japan is between 80 and 100 km per hour (km/h). What is the speed in Japan in miles per hour (mph)? (6 points)
5. A runner of a Spartan race in Blue Mountain Ski completed the race in 108 minutes with an average speed of 6.71 mph. What is the approximate distance of the race in miles? (6 points)

Equation in Engineering Technology with unknown variables

6. (5 points) 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 1.2 minutes if the current is constant at 250 mA? Hint: 1 minute = 60 seconds _____
7. Given the voltage formula $V = \frac{W}{Q}$ If the potential difference between two points is 18 V, how much energy is expected to bring 8.25 mC from one point to the other? (6 points)
8. Given the current formula $I = \frac{Q}{t}$ If the current in a conductor is constant at 25 mA, how much time is required for 16.8 μC to pass through the conductor? (6 points)
9. (6 points) 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 52.35 μC between two points if the voltage between the points is 7.6 V.

Solving for an unknown variable

Solve the unknown variable

1. (6 points) $10 + 4x = 5(x - 6) + 33$

$x =$ _____

2. (6 points) $\frac{1}{10}(k + 11) = -2(8 - k)$

$k =$ _____

3. (6 points) $0.65(V_A - 7) = -3.5(8.62 - 0.2V_A)$

$V_A =$ _____

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