Introduction to circuit analysis

Homework 2 – Basic Circuit Terminology and basic laws

Instructions:

- You have to show all work in order to receive full credit
- All answer must be in engineering notation rounded off to the **hundredth**

1. Convert 0.0000187361 km to mm (millimeters)

2. Convert 305184 Ω to kΩ

3. Given the voltage formula $V = \dfrac{w}{Q}$ If the potential energy between two points is 8.6 V, how much energy is expected to bring 107.25 µC from one point to the other?

For question 4 and 5. Given the current formula $I = \dfrac{Q}{t}$

4. If a current of 90.63 nA exists for 1.7 hours in a wire, how many coulombs of charge have passed through the wire?

5. How many minutes will a charge of 2.63 C passes through a light bulb if the current is constant at 250.92 µA

Ohm's Law

Question 6-8 ➔

6. What is the resistance if the current through the resistor is 11.2 mA and the voltage drop across it is 101.5 V?

7. If a voltmeter has an internal resistance of 8.2 kΩ find the current through the meter when it reads 11.5 V.

8. In a TV camera, a current of 6.2 mA passes through a resistor of 1.8 MΩ, What is the voltage drop across the resistor?

Power Law

Question 9-10 ➔

9. The power consumed by a 39 kΩ resistor is 23.5 μW. What is the current level through the resistor?

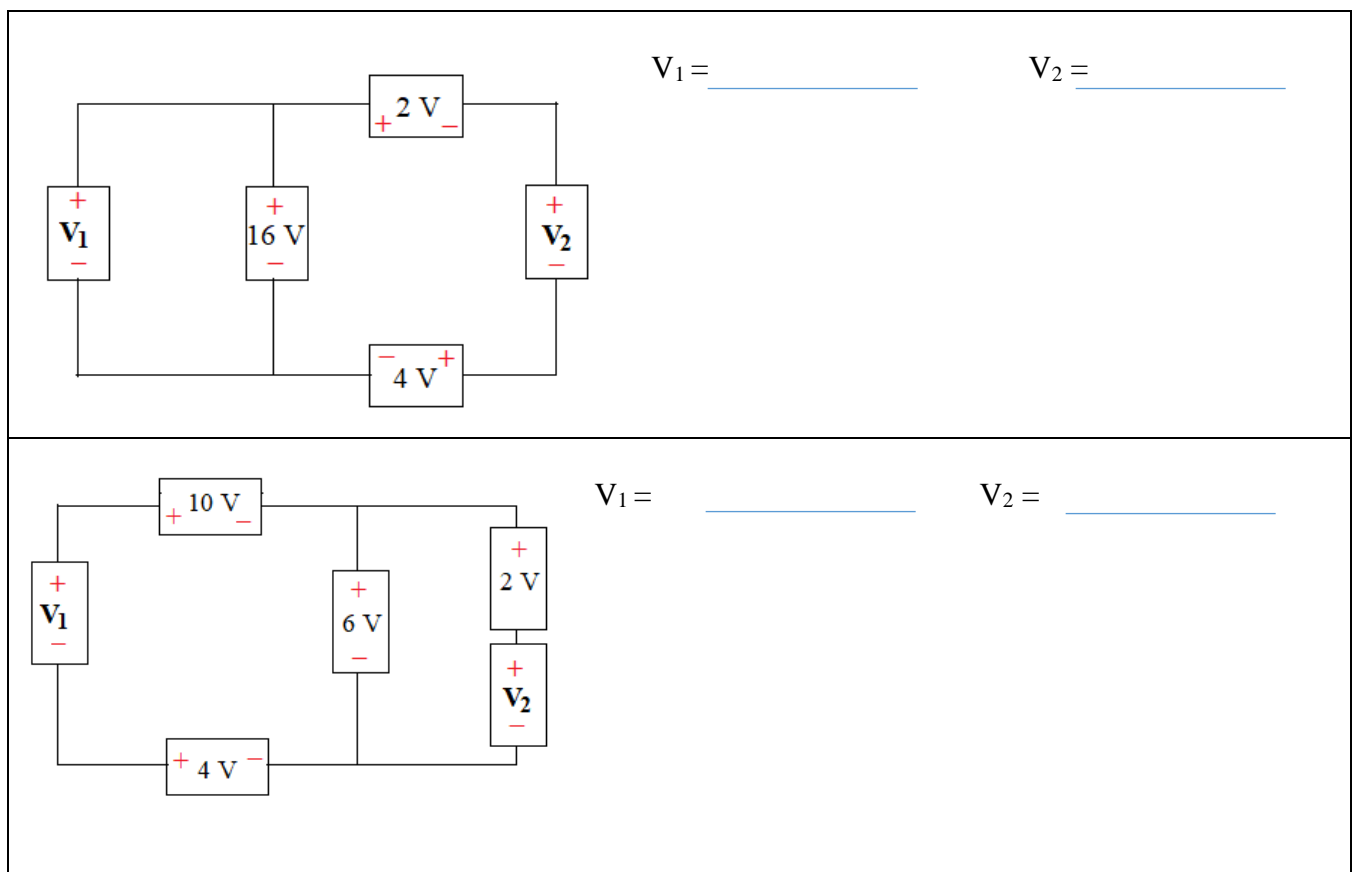10. A 2.2 kΩ resistor in a stereo system dissipates 42 mW of power. What is the voltage across the resistor?

Question 11-12 ➔

11. What are the "hot" resistance level and current rating of a 110 V, 80 W bulb?

12. What is the power delivered by a 10.85 V battery if the current drain is 26.3 mA?

Kirchhoff's t Laws
   13. Use Kirchhoff's Voltage Law (KVL) to find the unknown voltage

$V_1 =$ _____ $V_2 =$ _____

$V_1 =$ _____ $V_2 =$ _____

14. Use Kirchhoff's Current Law (KCL) to find the unknown current

$I_A =$ _____

R2

3 A

R1

2 A

5 A

I_A

I_B

$I_B =$ _____

2 A

I_D 6 A

7 A I_A I_B I_C

3 A

3 A

$I_A =$ _____ $I_B =$ _____

$I_C =$ _____ $I_D =$ _____

Circuit Terminologies

15. For the following circuit,

R2

V2

R1

I1

R3

R4

V1

V3
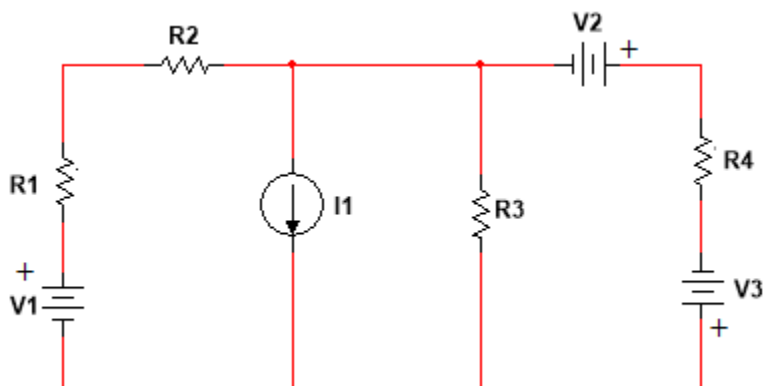
The number of independent loops is: _____

The number of elements is: _____

The number of nodes is: _____

-------------------------------------- Homework 2 Ends Here --------------------------------------