***CSE250: Circuits and Electronics***

***Spring 2023***

***Practice Problems Set 1***

| 1. Calculate the amount of charge represented by 6.667 billion protons. | ***Answer:*** *1.0681× 10−9* | | | | | | | | | |
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| 1. If the potential difference between two points is 60 V, how much energy is expended to bring 8 mC from one point to the other? | | | | | ***Answer:*** *0.48 J* | | | | | |
| 1. How much charge passes through a radio battery of 9 V if the energy expended is 72 J? | | | | | ***Answer:*** *8 C* | | | | | |
| 1. To move charge q from point b to point a requires 25 J. Find the voltage drop if: (a) q = 5 C, (b) q = −10 C. | | | | | ***Answer:*** *(a) 5V, (b) – 2.5 V* | | | | | |
| 1. If 10 J work is done on a – 2C charge in moving it from point A to point B, where VB = 20 V, what is the potential of point A? | | | | | ***Answer:*** *22 V* | | | | | |
| 1. The total charge entering a terminal is given by q = (10 − 10e−2t) mC. Calculate the current at t = 0.5 s. | | | | | ***Answer:*** *2.707 mA* | | | | | |
| 1. A home electric heater draws 10 A when connected to a 115 V outlet. How much energy is consumed by the heater over a period of 6 hours? | | | | | ***Answer:*** *6.9 kWh* | | | | | |
| 1. Find the power supplied/absorbed by each of the elements shown in the circuit below. | | ***Answer:*** | | | | | | | | |
| 1. For the network shown below,   **a.** Determine the open-circuit voltage VL.  **b.** If the 2.2 kΩ resistor is short circuited, what is the new value of ?  **c.** Determine if the 4.7 kΩ resistor is replaced by an open circuit. | | | | | | | | ***Answer:*** | | |
| 1. Find . | | | | | | | | | | ***Answer:***, ,  , ,  12 V |
| 1. Assuming identical supplies, determine the current I and resistance R for the parallel network shown below. | | | | | | | ***Answer:*** | | | |
| 1. Given the circuit below, use KVL to find the branch voltages to | | | | | ***Answer:*** | | | | | |
| 1. Obtain through in the following circuit. | | | | | | | | ***Answer:*** *2 V, −22 V, 10 V.* | | |
| 1. Find and in the following circuit.Diagram, schematic     Description automatically generated | | | ***Answer:*** *.* | | | | | | | |
| 1. Using the voltage divider rule, find the unknown resistance for the configuration below. | | | | | | ***Answer:*** *1.5 MΩ.* | | | | |
| 1. Find and in the circuit shown below. | | | | ***Answer:*** | | | | | | |
| 1. Find for the circuit shown below. | | | | | | | | | ***Answer:*** *19 Ω* | |
| 1. Find the equivalent resistance at terminals . | | | | | | | **Answer:** 27.5 Ω. | | | |

1. Insert I-V characteristics related problems
2. Insert Node Identification related problems (specially with grounds)