Name Answer Key Date _____

Honors Physics Electric Circuits WS #2H

Period _____ Mrs. Nadworny

Current

Directions: Read online textbook pages 694 – 699 and p. 701. Solve the following problems using the GUESS method and proper significant figures. Be sure to show ALL work.

1. A 2700-ohm resistor in an electric circuit draws a current of 2.4 milliamperes. The total charge that passes through the resistor in 15 seconds is

   (A) 1.6×10^{-4} C (B) 3.6×10^{-2} C (C) 1.6×10^{-1} C (D) 3.6×10^{1} C

2. A net charge of 5.0 coulombs passes a point on a conductor in 0.050 second. The average current is

   (A) 8.0×10^{-8} A (B) 1.0×10^{-2} A (C) 2.5×10^{-1} A (D) 1.0×10^{2} A

3. An MP3 player draws a current of 0.120 ampere from a 3.00 volt battery. What is the total charge that passes through the player in 900. seconds?

   (A) 324 C (B) 108 C (C) 5.40 C (D) 1.80 C

4. What is the current in a wire in which 35 kC pass a point every 95 seconds?

$$I = \frac{q}{t} = \frac{35000C}{95s} = 370A$$

5. How many charges flow through a circuit if a 72 A current is allowed to flow for 3.5 minutes?

$$q = It = 72A(210s) = 15{,}000C$$

$$15{,}000C\left(\frac{1e}{1.60\times10^{-19}C}\right) = 9.4\times10^{22}e$$

6. The current in a wire is 5.0 amperes. Calculate the total amount of charge that travels through the wire in 36 seconds.

$$q = It = 5.0A(36s) = 180C$$

7. The current in a wire is 4.0 amperes. Calculate the time required for 2.5 x 10^{19} electrons to pass a certain point in the wire.

$$2.5\times10^{19}e\left(\frac{1.60\times10^{-19}C}{1e}\right) = 4.0C$$

$$t = \frac{I}{q} = \frac{4.0A}{4.0C} = 1.0s$$

Answers in size order: 1.0, 180, 370, 9.4 x 10^{22}