

Name Answer Key
Honors Physics
Period _____

Date _____
Electric Circuits WS #2H
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) $1.6 \times 10^{-4} \text{ C}$ (B) $3.6 \times 10^{-2} \text{ C}$ (C) $1.6 \times 10^{-1} \text{ C}$ (D) $3.6 \times 10^1 \text{ C}$
2. A net charge of 5.0 coulombs passes a point on a conductor in 0.050 second. The average current is
(A) $8.0 \times 10^{-8} \text{ A}$ (B) $1.0 \times 10^{-2} \text{ A}$ (C) $2.5 \times 10^{-1} \text{ A}$ (D) $1.0 \times 10^2 \text{ A}$
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?

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

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

$$q = It = 72\text{A}(210\text{s}) = 15,000\text{C}$$
$$15,000\text{C} \left(\frac{1e}{1.60 \times 10^{-19}\text{C}} \right) = 9.4 \times 10^{22} e$$

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

$$q = It = 5.0\text{A}(36\text{s}) = 180\text{C}$$

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

$$2.5 \times 10^{19} e \left(\frac{1.60 \times 10^{-19}\text{C}}{1e} \right) = 4.0\text{C}$$
$$t = \frac{q}{I} = \frac{4.0\text{C}}{4.0\text{A}} = 1.0\text{s}$$

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