Choose the best answer. (10 points total)

1. How is the static resistance of a circuit element defined?
   a. \( R = \frac{I}{V} \)  
   b. \( R = \frac{V}{I} \)  
   c. \( R = \frac{\Delta V}{\Delta I} \)  
   d. \( R = \frac{\Delta I}{\Delta V} \)

2. A conductor that obeys Ohm’s Law has a constant resistance independent of the __________, if the __________ is constant.
   a. current, temperature  
   b. applied voltage, temperature  
   c. temperature, applied voltage  
   d. current, applied voltage

3. The resistance of a conductor that follows Ohm’s Law can be calculated from the __________ of a graph of voltage versus current.
   a. tangent  
   b. slope  
   c. y-intercept  
   d. radius

4. If you measure the resistance of a conductor that follows Ohm’s Law at a temperature of 20°C and then again at a temperature of 200°C, will the two resistance values be the same?
   a. Yes  
   b. No

5. Dynamic resistance is simply the value of the __________ at a particular point along the \( V \) vs. \( I \) (voltage versus current) line or curve.
   a. slope  
   b. tangent  
   c. y-intercept  
   d. radius

6. Can a resistor follow Ohm’s “law” but not have a straight line graph of \( V \) vs. \( I \)?
   a. No  
   b. Yes, if the temperature was not kept constant during the experiment.

7. When a 10-V battery is connected to a resistor that follows Ohm’s “law”, the current in the resistor is 2 A. What is the resistance value of the resistor?
   a. 0.2 ohms  
   b. 5 ohms  
   c. 10 ohms  
   d. 20 ohms

8. In this experiment, the light bulb will be permanently damaged if you use more than _____.
   a. ± 1 volts  
   b. ± 1 Amps.  
   c. ± 5 volts  
   d. ± 5 Amps.

9. Besides putting in the diode, what do you have to change on the circuit board to measure the diode’s resistance?
   a. the toggle switch  
   b. the voltmeter  
   c. the power supply  
   d. the ammeter

10. Carbon resistors have four or five colors bands painted on them by the factory. The first two color bands (reading left to right) tell you the 1st and 2nd significant figures of the resistance value. The 3rd color band tells you what value to multiply the significant figures by. The 4th band tells you the tolerance (how close the color code is to the actual resistance). If you have a 5th band, it refers to the failure rate (how often they stop working). If you have a carbon resistor with a color code of Blue Red Orange Red, determine the resistance using the appendix. Resistance = __________ ± _______ Ohms  
    (Give tolerance in ohms also)