Attribution Nidhal Abdulaziz

In-class Tutorial 1 solutions

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

1) One ampere of current is present when one coulomb of charge passes through a conductor in one second. 1) _____

True

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

$V = \frac{W}{Q}$

2) Determine the potential difference if it takes 300 mJ of energy to move a charge of 67 microcoulombs. 2) _____

A) 45 kilovolts B) 0.45 kilovolts C) 4.5 kilovolts D) 450 kilovolts

$= \frac{300 \times 10^{-3}}{67 \times 10^{-6}} = 4.5\,kV$

3) If an electrical circuit can operate for 10.0 hours with a 2-Ah battery, what is the average current that the circuit demands? 3) _____

A) 5 amperes B) 2 amperes C) 20 amperes D) 0.2 amperes

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t

A) 5 amperes B) 2 amperes C) 20 amperes D) 0.2 amperes

$2\,(A \cdot h) = 10\,h$

$0.2\,A$

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

4) The free proton is the positive charge carrier in a solid conductor. 4) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

4) The free proton is the positive charge carrier in a solid conductor. 4) _____

False

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

5) What is the charge in coulombs if 8.5 mA of current flow through a surface every 90 ms? 5) _____

A) 770 microcoulombs B) 770 millicoulombs
C) 770 nanocoulombs D) 770 coulombs

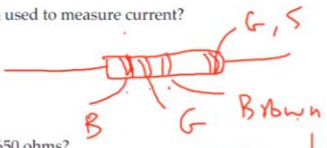
6) Germanium and silicon are examples of 6) _____

A) battery electrolytes B) insulators
C) semiconductors D) conductors

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

8) How must ammeters be connected in a circuit when used to measure current? 8) _____

A) Directly across the component
B) In series with the component being measured
C) Varies with circuit construction
D) Varies with the component being measured



9) What is the color code for a resistor whose value is 650 ohms? 9) _____

A) Green, Black, Brown B) Blue, Green, Brown
C) Brown, Black, Green D) Green, Blue, Brown

65×10^{1}

650 Ω

10) Doubling the length of a conductor 10) _____

A) increases resistance by a factor of 4. B) doubles the resistance.
C) cuts the resistance in half. D) decreases resistance by a factor of 4.

$R = \rho \frac{l}{A}$

11) A superconductor is 11) _____

A) a conductor of electric charge that exhibits zero resistance only in zero-gravity conditions.
B) a conductor of electric charge that has virtually no resistance when subjected to very low temperatures.
C) a conductor of electric charge that exhibits a negative resistance effect.
D) a conductor of electric charge that has sufficient cross-sectional area to make its resistance nearly zero.

12) Which *one* of these statements is true of the ohmmeter? 12) _____

A) It is used to measure resistance of a single resistor in a network without removing the resistor from the circuit.
B) It should be stored with the selector switch in the resistance mode.
C) It displays a resistance of zero if the leads touch each other, and an infinite reading if there is no connection at all.
D) It is used to measure resistance in a circuit only if the circuit is powered by low-voltage batteries.

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

13) A fuse is a device whose sole purpose is to ensure that voltage levels do not exceed a safe level. 13) _____

14) Ohm's law shows that current is directly proportional to the applied voltage and is inversely proportional to resistance. 14) _____