**Unit 2: Magnetic Induction**

**TRUE/FALSE**

1. The polarity of the induced voltage is determined by the polarity of the magnetic field in relation to the direction of movement.

ANS: T PTS: 1 REF: Magnetic Induction

2. The important factors concerning magnetic induction are a magnetic field, movement, and polarity.

ANS: F PTS: 1 REF: Moving Magnetic Fields

3. If a conductor cuts magnetic lines of flux at a rate of 1 V, a voltage of 1 Wb/s will be induced.

ANS: F PTS: 1 REF: Determining the Amount of Induced Voltage

4. The induced voltage is proportional to the rate of change of current (speed of the cutting action).

ANS: T PTS: 1 REF: Rise Time of Current in an Inductor

5. The exponential curve describes a rate of certain occurrences and is divided into four time constants.

ANS: F PTS: 1 REF: The Exponential Curve

6. The exponential curve can often be found in nature.

ANS: T PTS: 1 REF: The Exponential Curve

7. Inductance is measured in units called the henry and is represented by the letter *H*.

ANS: F PTS: 1 REF: Inductance

8. The time necessary for current in an inductor to reach its full Ohm’s law value, called the R-L time constant, can be computed using the formula L = H / R.

ANS: F PTS: 1 REF: Inductance

9. A device that can be used for spike suppression in either direct- or alternating-current circuits is the metal oxide varistor (MOV).

ANS: T PTS: 1 REF: Induced Voltage Spikes

10. A device that uses the collapsing magnetic field of an inductor to produce a very low voltage is the electric-fence charger.

ANS: F PTS: 1 REF: Induced Voltage Spikes

**MULTIPLE CHOICE**

1. The principle of magnetic \_\_\_\_ states that whenever a conductor cuts through magnetic lines of flux, a voltage is induced into the conductor.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | induction | c. | reduction |
| b. | conduction | d. | fluctuation |

ANS: A PTS: 1 REF: Magnetic Induction

2. Three factors determine the amount of voltage that will be induced in a conductor: the number of turns of wire, the strength of the magnetic field (flux density),and the \_\_\_\_ of the cutting action.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | speed | c. | intensity |
| b. | movement | d. | direction |

ANS: A PTS: 1 REF: Determining the Amount of Induced Voltage

3. In magnetic measurement, \_\_\_\_ lines of flux are equal to one weber (Wb).

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 100,000 | c. | 10,000,000 |
| b. | 1,000,000 | d. | 100,000,000 |

ANS: D PTS: 1 REF: Determining the Amount of Induced Voltage

4. When a resistive load is suddenly connected to a source of direct current, the current will instantly \_\_\_\_.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | drop to its minimum value | c. | become erratic |
| b. | rise to its maximum value | d. | stop flowing |

ANS: B PTS: 1 REF: Rise Time of Current in an Inductor

5. Each time constant in an exponential curve is equal to \_\_\_\_% of some value.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 20.0 | c. | 33.3 |
| b. | 25.0 | d. | 63.2 |

ANS: D PTS: 1 REF: The Exponential Curve

6. A coil has an inductance of one \_\_\_\_ when a current change of one ampere per second results in an induced voltage of one volt.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | david | c. | weber |
| b. | henry | d. | paul |

ANS: B PTS: 1 REF: Inductance

7. Iron-core inductors cannot be used for high-frequency applications because of \_\_\_\_ loss and hysteresis loss in the core material.

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| --- | --- | --- | --- |
| a. | electrical current | c. | polarity |
| b. | phosphoresis | d. | eddy current |

ANS: D PTS: 1 REF: Inductance

8. A(n) \_\_\_\_ occurs when the current flow through an inductor stops, and the current decreases at an exponential rate also.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | voltage jolt | c. | wattage jolt |
| b. | amp spike | d. | voltage spike |

ANS: D PTS: 1 REF: Induced Voltage Spikes

9. A device often used to prevent induced voltage spikes when the current flow through an inductor is stopped is the \_\_\_\_.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | closed switch | c. | electrode |
| b. | diode | d. | iron-core inductor |

ANS: B PTS: 1 REF: Induced Voltage Spikes

10. A(n) \_\_\_\_ diode has a forward voltage drop of approximately 0.7 V regardless of the current flowing through it.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | MOV | c. | oxide |
| b. | iron | d. | silicon |

ANS: D PTS: 1 REF: Induced Voltage Spikes