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
b. conduction
c. reduction
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
b. movement
c. intensity
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
b. 1,000,000
c. 10,000,000
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
b. rise to its maximum value
c. become erratic
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
b. 25.0
c. 33.3
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
b. henry
c. weber
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.
a. electrical current
b. phosphoresis
c. polarity
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
b. amp spike
c. wattage jolt
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
b. diode
c. electrode
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
    b. iron
    c. oxide
    d. silicon

ANS: D PTS: 1 REF: Induced Voltage Spikes