

## Unit 2: Magnetic Induction

Test Bank for Electrical Transformers and Rotating Machines 4th Edition by  
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**Solution Manual:**

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### 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