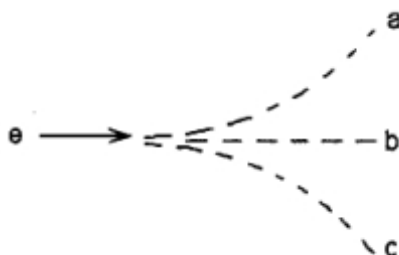


TALLER DE ELECTROMAGNETISMO

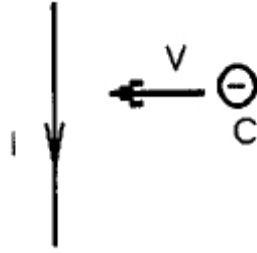
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

FIGURE 19-2



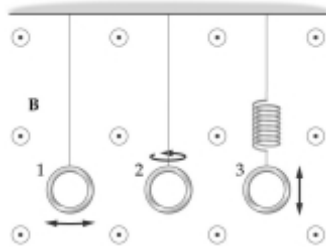
- 1) Consider a magnetic field pointing out of this page, as shown in Fig. 19-2. An electron moving on the page toward the right will 1) _____
- A) continue straight ahead (path b).
 - B) curve upward (path a).
 - C) curve downward (path c).
 - D) slow down.
 - E) speed up.
- 2) A charged particle moves with a constant speed through a region where a uniform magnetic field is present. If the magnetic field points straight upward, the magnetic force acting on this particle will be maximum when the particle moves 2) _____
- A) upward at an angle of 45° above the horizontal.
 - B) straight downward.
 - C) straight upward.
 - D) horizontally.
- 3) The magnetic force between parallel wires is used by the National Bureau of Standards to define the 3) _____
- A) Tesla.
 - B) Newton.
 - C) square-meter.
 - D) Ampere.
 - E) Coulomb.

FIGURE 19-3



- 4) A wire lying in the plane of the page carries a current toward the bottom of the page, as shown in Fig. 19-3. What is the direction of the magnetic force it produces on an electron that is moving perpendicularly toward the wire, also in the plane of the page, from your right? 4) _____
- A) zero
 - B) perpendicular to the page and away from you
 - C) toward the bottom of the page
 - D) toward the top of the page
 - E) perpendicular to the page and towards you
- 5) The magnetic field near a strong permanent bar magnet might be 500 5) _____
- A) microGauss.
 - B) Gauss.
 - C) Tesla.
 - D) MT.
 - E) milliGauss.
- 6) Faraday's law of induction states that the emf induced in a loop of wire is proportional to 6) _____
- A) the magnetic flux.
 - B) the magnetic flux density times the loop's area.
 - C) the time variation of the magnetic flux.
 - D) current divided by time.
- 7) Lenz's Law is a consequence of the law of conservation of 7) _____
- A) momentum.
 - B) charge.
 - C) mass.
 - D) electric field.
 - E) energy.

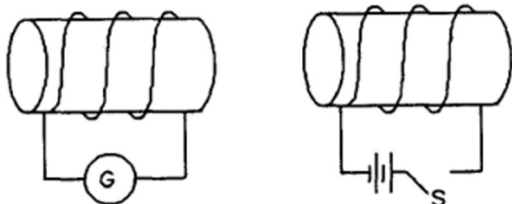
FIGURE 20-4



- 8) The three loops of wire shown in Fig. 20-4 are all subject to the same uniform magnetic field \vec{B} that does not vary with time. Loop 1 oscillates back and forth as the bob in a pendulum, loop 2 rotates about a vertical axis, and loop 3 oscillates up and down at the end of a spring. Which loop, or loops, will have an induced emf? 8) _____
- A) Loop 1
 B) Loop 2
 C) Loop 3
 D) Loops 1 and 3
 E) Loops 2 and 3
- 9) An electric generator transforms 9) _____
- A) alternating current into direct current.
 B) direct current into alternating current.
 C) electrical energy into mechanical energy.
 D) chemical energy into electrical energy.
 E) mechanical energy into electrical energy.
- 10) If the number of turns on the secondary coil of a transformer are less than those on the primary, the result is a 10) _____
- A) step-down transformer.
 B) a dc transformer.
 C) step-up transformer.
 D) 120-V transformer.
 E) 220-V transformer.
- 11) Electric power is transmitted over long distances at high voltage because 11) _____
- A) electricity moves slower at higher voltage.
 B) the lines can be on taller poles.
 C) electricity moves faster at higher voltage.
 D) there is less power lost.
 E) lightning does more damage.
- 12) A flat coil is in a uniform magnetic field. The magnetic flux through the coil is greatest when the plane of its area is 12) _____
- A) at 45° with the magnetic field.
 B) parallel to the magnetic field.
 C) perpendicular to the magnetic field.
- 13) According to Faraday's law, a coil in a strong magnetic field must have a greater induced emf in it than a coil in a weak magnetic field. 13) _____
- A) True
 B) False

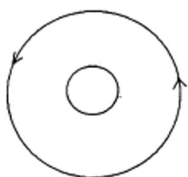
14) According to Lenz's law, the induced current in a circuit always flows to oppose the external magnetic flux through the circuit. 14) _____
 A) True B) False

15) Two solenoids are close to each other, as shown in the figure, with the switch S open. When the switch is suddenly closed, which way will the induced current flow through the galvanometer in the left-hand solenoid? 15) _____



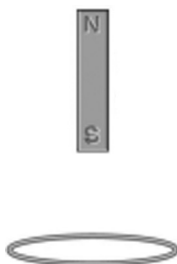
- A) from right to left
- B) from left to right
- C) There will be no induced current through the galvanometer.

16) An outer metal ring surrounds an inner metal ring, as shown in the figure. The current in the outer ring is counterclockwise and decreasing. What is the direction of the induced current in the inner ring? 16) _____



- A) counterclockwise
- B) clockwise
- C) There is no induced current in the inner ring.

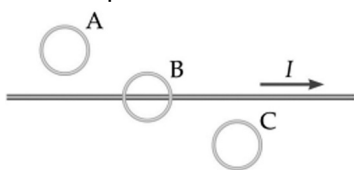
17) A bar magnet is oriented above a copper ring, as shown in the figure. If the magnet is pulled upward, what is the direction of the current induced in the ring, as viewed from above? 17) _____



- A) There is no current in the ring.
- B) counterclockwise
- C) clockwise

18) The wire in the figure carries a current I that is increasing with time at a constant rate. The wire and the three loops are all in the same plane. What is true about the currents induced in each of the three loops shown?

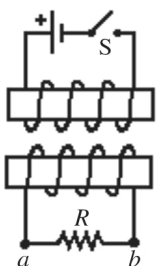
18) _____



- A) The currents are counterclockwise in all three loops.
- B) No current is induced in any loop.
- C) Loop A has clockwise current, loop B has no induced current, and loop C has counterclockwise current.
- D) The currents are clockwise in all three loops.
- E) Loop A has counterclockwise current, loop B has no induced current, and loop C has clockwise current.

19) As shown in the figure, two solenoids are side by side. The switch S is initially open. When S is suddenly closed, the direction of the induced current through the resistor R is

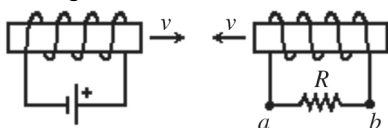
19) _____



- A) from b to a .
- B) from a to b .
- C) No current is induced.

20) As shown in the figure, a battery supplies a steady current to the solenoid on the left. The two solenoids are moving toward each other with speeds v . The direction of the induced current through the resistor R is

20) _____



- A) from b to a .
- B) from a to b .
- C) No current is induced.