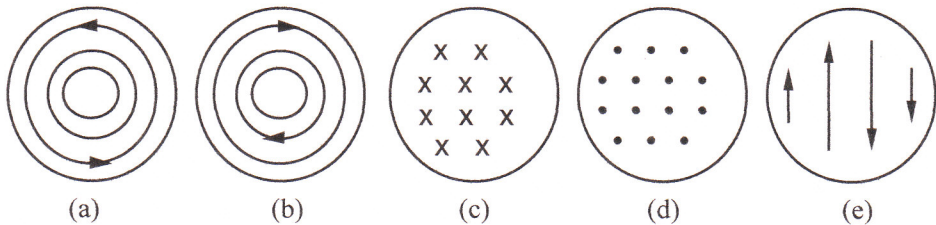


2. A coil of wire carries current I flowing clockwise as shown in the figure. The outer circle is the current loop. If the observer could "see" the magnetic field inside this arrangement of loops, how would it appear?

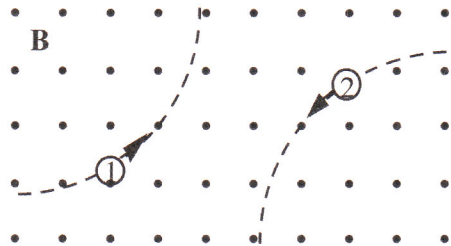


3. A conducting loop of wire is placed in a magnetic field that is normal to the plane of the loop. Which one of the following actions will **not** result in an induced current in the loop?
- Rotate the loop about an axis that is parallel to the field and passes through the center of the loop.
 - Increase the strength of the magnetic field.
 - Decrease the area of the loop.
 - Decrease the strength of the magnetic field.
 - Rotate the loop about an axis that is perpendicular to the field and passes through the center of the loop.

6. It is widely believed that a lightning bolt can cause a harmful current to flow in the circuit of an appliance, thereby damaging it. Which of the following is a true statement concerning this idea?
- a. A current will flow in the appliance circuit only if the lightning actually strikes an electrical conductor connected to the appliance circuit.
 - b. A current will flow only in circuits that do not contain capacitors connected in series.
 - c. This effect will occur only in AC circuits, not in DC circuits.
 - d. The lightning bolt consists of a huge sudden current, and this generates a large changing magnetic field. The resulting increase in magnetic flux in an appliance circuit can induce a large EMF in the circuit, and this can cause a damaging current to flow.
 - e. The lightning bolt has a net negative electrical charge, and this induces an opposite positive charge in the appliance circuit.

8. Two particles move through a uniform magnetic field that is directed out of the plane of the page. The figure shows the paths taken by the two particles as they move through the field. The particles are not subject to any other forces or fields. Which one of the following statements concerning these particles is true?

- The particles may both be neutral.
- Particle **1** is positively charged; **2** is negative.
- Particle **1** is positively charged; **2** is positive.
- Particle **1** is negatively charged; **2** is negative.
- Particle **1** is negatively charged; **2** is positive.



9. Five balls labeled **A**, **B**, **C**, **D**, and **E** are placed in front of a plane mirror as shown in the figure. Which ball(s) will the observer see reflected in the mirror?

- A** only
- C** only
- A** and **B**
- A**, **B**, **D** and **E**
- A**, **B**, **C**, **D** and **E**

