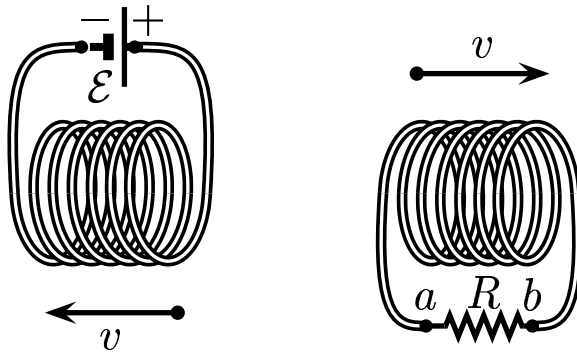
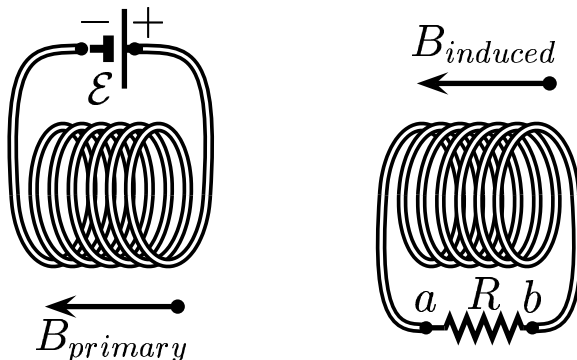


Given: Two coils are suspended around a central axis as shown in the figure below. One coil is connected to a resistor with ends labeled “a” and “b”. The other coil is connected to a battery \mathcal{E} . The coils are moving relative to each other as indicated by the velocity vectors v .



What is the direction of the induced magnetic field in the coil with the resistor attached and what is the direction of the induced current in resistor R when the coil with the battery attached is moving from right to left?

- A) ($\leftarrow B_{induced}$) right to left and ($I \rightarrow$) from “a” through R to “b”.
 B) ($B_{induced} \Rightarrow$) left to right and ($I \rightarrow$) from “a” through R to “b”.
 C) ($\leftarrow B_{induced}$) right to left and ($I \leftarrow$) from “b” through R to “a”.
 D) ($B_{induced} \Rightarrow$) left to right and ($I \leftarrow$) from “b” through R to “a”.



The magnetic flux through the coil is from right to left. When the energized coil moves from right to left, the magnetic flux through the coil with the attached resistor decreases.

The induced current in the coil must produce an induced magnetic field from right to left ($\leftarrow B_{induced}$) to resist any change of magnetic flux in the coil (Lenz’s Law).

The helical coil with the resistor attached (when viewed from either end) is wound counter-clockwise (as you go into the coil).

Since the induced field is right to left ($\leftarrow B_{induced}$) the induced current in the coil flows clockwise when viewing the coil from the right-hand side.

Therefore the current flows from “b” through R to “a” ($\leftarrow I$).

Answer C.