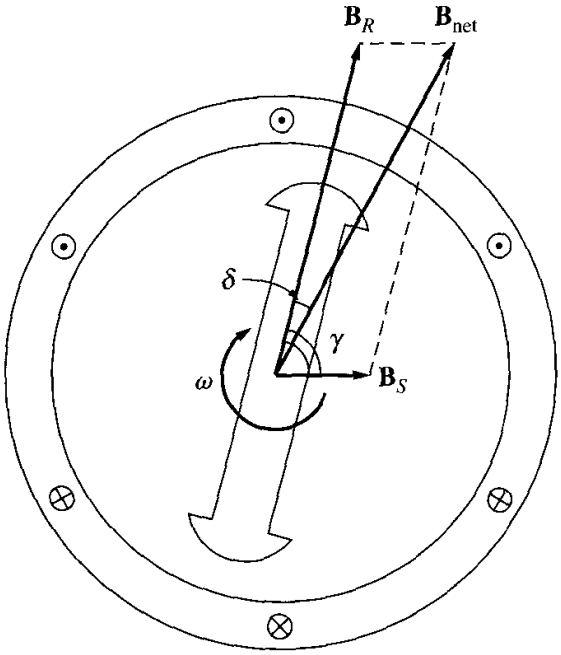
4–5 If an AC machine has the rotor and stator magnetic fields shown in Figure P4–1, what is the direction of the induced torque in the machine? Is the machine acting as a motor or generator?

Figure P4–1 | The AC machine of Problem 4–5.



Per (4-49), $\overline{\tau}_{ind} = k\,\overline{B}_R \times \overline{B}_{net}$. From the figure, applying this equation gives

$\Rightarrow$ **torque vector into the page with clockwise (CW) rotation.**

Since the induced rotation from the torque is the same direction as the rotation ω shown

$\Rightarrow$ **machine acts as a motor.**