*Rotating loop in a rotating magnetic field.* Assume that the magnetic flux density vector $\mathbf{B}$ in Fig. Q6.9 also rotates, in the same direction as the loop, with an angular velocity $\omega_B$, where $\omega_B > \omega$ (vectors $\omega$ and $\omega_B$ are collinear and in the same direction). With $\mathcal{E}_0$, $\mathcal{E}_{01}$, and $\mathcal{E}_{02}$ standing for respective constants, the induced emf in the loop is given by

(A) $e_{\text{ind}}(t) = \mathcal{E}_0 \cos \omega t$.
(B) $e_{\text{ind}}(t) = \mathcal{E}_0 \cos \omega_B t$.
(C) $e_{\text{ind}}(t) = \mathcal{E}_{01} \cos \omega t + \mathcal{E}_{02} \cos \omega_B t$.
(D) $e_{\text{ind}}(t) = \mathcal{E}_0 \cos(\omega_B - \omega) t$.
(E) $e_{\text{ind}}(t) = \mathcal{E}_0 \cos(\omega_B + \omega) t$.

*Solution:* (D)
*Answer:* (D)