Electromagnetic induction in a nonlinear magnetic circuit. A coil of wire, with a low-frequency time-harmonic current $i(t) = I_0 \cos \omega t$, is wound uniformly and densely about a thin toroidal core made of a nonlinear ferromagnetic material that exhibits hysteresis effects. Consider the magnetic flux density, $B(t)$, and magnetic field intensity, $H(t)$, in the core, as well as the induced emf, $e_{ind}(t)$, in the coil. Which of these quantities are time-harmonic functions?

(A) $B(t)$ only.
(B) $H(t)$ only.
(C) $B(t)$ and $H(t)$ only.
(D) $B(t)$ and $e_{\mathrm{ind}}(t)$ only.
(E) All three quantities.
(F) None of the quantities.

Solution: (B)
Answer: (B)