Air gap in a simple linear magnetic circuit. A thin toroidal core, made of a ferromagnetic material of permeability μ, has an air gap, as shown in Fig.Q5.7. There is a time-invariant current through the winding. The magnitude of the magnetic field intensity vector in the ferromagnetic with respect to the clockwise reference direction is H. The magnitude of the magnetic field intensity vector in the gap (H_0) with respect to the same reference direction is

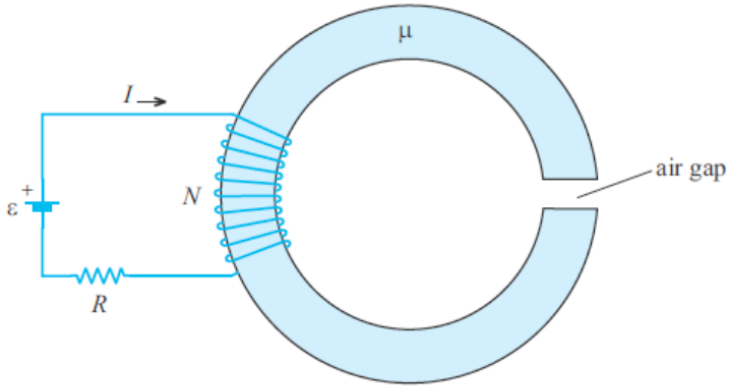

Figure Q5.7 Simple linear magnetic circuit with an air gap; for Question 5.18.

(A) $H_0 = H$.
(B) $H_0 = 0$.
(C) $H_0 = \mu_0 H$.
(D) $H_0 = \mu_0 H/\mu$.
(E) $H_0 = \mu H/\mu_0$.

Solution: (E)
Answer: (E)