Inductance of a loop with a linear magnetic core. If a piece of a ferromagnetic material of relative permeability μ_r is placed as a core of a wire loop, as indicated in Fig. Q7.3, the inductance of the loop, L, is related that, L_o, of the same loop with no core as follows:

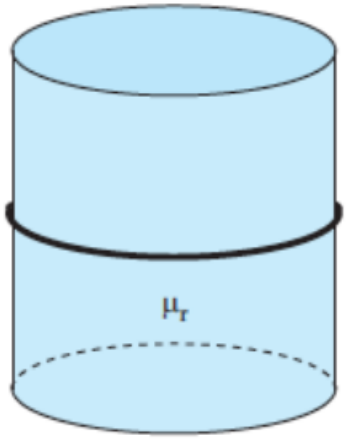

Figure Q7.3 Wire loop with a linear ferromagnetic core; for Question 7.7.

(A) $L = \mu_r L_o$.
(B) $L_o < L < \mu_r L_o$.
(C) $L = L_o$.
(D) $L = L_o/\mu_r$.
(E) $L = \mu_r \mu_o L_o$.
(F) $L = L_o/(\mu_r \mu_o)$.

(μ_o is the permeability of a vacuum.)

Solution: (B)
Answer: (B)