Amperian contour outside a current conductor. A time-invariant current of intensity I ($I > 0$) is established in a cylindrical copper conductor. The conductor is situated in air. The circulation (line integral) of the magnetic flux density vector, $\mathbf{B}$, along a contour C composed from two circular and two radial parts and positioned outside the conductor, as shown in Fig. Q4.5, is

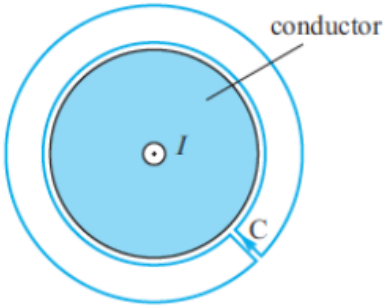

Figure Q4.5 Amperian contour outside a conductor with a steady current; for Question 4.7.

(A) $\mu_0 I$
(B) $-\mu_0 I$
(C) greater than $\mu_0 I$
(D) positive and less than $\mu_0 I$
(E) zero

(μ_0 is the permeability of vacuum).

Solution: (E)
Answer: (E)