

Answer on Question #75074, Physics / Electromagnetism

The earth magnetic induction at a certain points $7/100000$ Wb/m². This field is to be annulled by magnetic induction at the centre of a circular conducting loop 5.0 cm in radius. The current required is nearly. (1) 5.6 A. (2) 56A. (3) 2.8 A. (4) 28 A.

Solution:

Field created at the center 7×10^{-5} Wb/m²

The magnetic field in the center of the circular current is

$$H = \frac{\mu_0}{2r} i$$

So, we get

$$i = \frac{2rH}{\mu_0}$$

Finally

$$i = \frac{2 \times (5 \times 10^{-2} \text{ m}) \times (7 \times 10^{-5} \text{ Wb/m}^2)}{4\pi \times 10^{-7} \text{ H/m}} = 5.6 \text{ A}$$

Answer: (1) 5.6 A

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