

Question#22680

A point within 5 cm of electric current carrying wire has a large magnetic field of 10 Tesla. What is the magnetic field of a point within 16 cm of the electric current carrying wire

Answer:

According to the Biot-Savart law an equation that describes the magnetic field generated by electric current carrying wire is:

$$\mathbf{B} = \frac{\mu}{4\pi} \frac{2I}{R}$$

Where μ is the magnetic constant, I is the value of the current, R is the distance from wire.

Such as magnitude of magnetic field linearly depends from distance, the magnitude in the current point is:

$$\mathbf{B} = \frac{R_0}{R} \mathbf{B}_0$$

Where R_0 is the distance to the previous point, \mathbf{B}_0 is the magnitude in the previous point, R is the distance of current point.

$$\mathbf{B} = \frac{5}{16} \mathbf{10} = 3.125 \text{ Tesla}$$

Answer: 3.125 Tesla.