49. We interpret the given $2.50\,\text{MeV} = 2500\,\text{keV}$ to be the kinetic energy of the electron. Using Table 38-3 and Eq. 38-49, we find

$$\gamma = \frac{K}{m_e c^2} + 1 = \frac{2500\,\text{keV}}{511\,\text{keV}} + 1 = 5.892\ ,$$

and (from Eq. 38-8)

$$\beta = \sqrt{1 - \frac{1}{\gamma^2}} = 0.9855\ .$$

Therefore, using the equation introduced in problem 46 (with "q" interpreted as $|q|$), we obtain

$$\begin{aligned} B &= \frac{\gamma\, m_e\, v}{|q|\, r} = \frac{\gamma m_e \beta c}{er} \\ &= \frac{(5.892)\left(9.11 \times 10^{-31}\,\text{kg}\right)(0.9855)\left(2.998 \times 10^{8}\,\text{m/s}\right)}{(1.6 \times 10^{-19}\,\text{C})\,(0.030\,\text{m})} \\ &= 0.33\ \text{T}\ . \end{aligned}$$