A 0.4 A current is charging a capacitor that has parallel circular plates 13 cm in radius. The plate separation is 5 mm. Show your work below.

(a) What is the magnitude and direction of the magnetic field at point \( a \), which is between the plates at a distance of 7 cm from their center?

\[
\oint B \cdot dl = \mu_0 I / \varepsilon_0 + \mu_0 \varepsilon_0 \frac{d\Phi}{dt}
\]

\[
E = \frac{\Phi}{\varepsilon_0} = \frac{Q}{\pi R^2 \varepsilon_0} 
\Rightarrow \Phi = \frac{Q}{\pi R^2 \varepsilon_0} 
\Rightarrow \frac{d\Phi}{dt} = \frac{-r^2}{R^2 \varepsilon_0} \frac{dQ}{dt} = 1.309 \times 10^{-10}
\]

\[
B = \frac{\mu_0 I}{2\pi (0.07)} = 3.14 \times 10^{-7} T
\]

(out of page)

Magnitude: \( 3.14 \times 10^{-7} \) T

Direction: out of page (a verbal description)

(b) What is the magnitude and direction of the magnetic field at point \( b \), which is far away from the plates at a distance of 7 cm from the current?

\[
B = \frac{\mu_0 I}{2\pi (0.07)} = 1.143 \times 10^{-6} T
\]

(out of page)

Magnitude: \( 1.143 \times 10^{-6} \) T

Direction: out of page (a verbal description)