$$\vec{J}(r) = \begin{cases} -J_0 \hat{n} & r<a \\ \beta\sqrt{r} & a<r<b \\ 0 & \sim \end{cases}$$

para $r<a$

$$\oint \vec{B}\cdot d\vec{l} = 2\pi \mu_0 \int_0^r J(r)\, r\, dr \qquad +0,5$$

$$2\cancel{\pi} r \vec{B} = -\mu_0 \cancel{\pi} r^2 J_0 \hat{\theta}$$

$$\vec{B} = -\frac{\mu_0 J_0}{2} r \hat{\theta} \qquad +0,5$$

para $a<r<b$

$$2\pi r \vec{B} = -\mu_0 \pi a^2 J_0 \hat{\theta} + \mu_0 \int_a^r \beta r'^{1/2} \cdot 2\pi r' dr' \hat{\theta} \qquad +1,0$$

$$= -\mu_0 \pi a^2 J_0 \hat{\theta} + 2\pi \mu_0 \beta \int_a^r r'^{3/2} dr' \hat{\theta}$$

$$2\cancel{\pi} r \vec{B} = -\mu_0 \cancel{\pi} a^2 J_0 \hat{\theta} + 2\cancel{\pi} \mu_0 \beta \frac{2}{5}\left(r^{5/2} - a^{5/2}\right)\hat{\theta} \qquad *$$

$$\Rightarrow \vec{B} = \frac{2\mu_0 \beta r^{3/2}}{5}\hat{\theta} - \frac{\mu_0}{2r} a^2\left(J_0 + \frac{4\beta}{5} a^{1/2}\right)\hat{\theta} \qquad +1,0$$

Por $r > b$ evaluamos el lado derecho de $\ast$ en $r=b$

$$\vec{B} = \frac{2\mu_0}{5r}\beta\left(b^{5/2} - a^{5/2}\right)\hat{\theta} - \frac{\mu_0 a^2 J_0}{2r}\hat{\theta}$$ +1,0

b)

para que $\vec{P} = 0$ se necesita $\vec{B} = 0$ +1,0

así $\frac{2\cancel{\mu_0}\beta}{5}\left(b^{5/2} - a^{5/2}\right) = \frac{\cancel{\mu_0} a^2 J_0}{2}$

$$\beta = \frac{5 J_0 a^2}{4\left(b^{5/2} - a^{5/2}\right)}$$ +1,0