28. (a) Noting that the magnitude of the electric field (assumed uniform) is given by $E = V/d$ (where $d = 5.0$ mm), we use the result of part (a) in Sample Problem 32-3

$$B = \frac{\mu_0 \varepsilon_0 r}{2} \frac{dE}{dt} = \frac{\mu_0 \varepsilon_0 r}{2d} \frac{dV}{dt} \qquad \text{(for } r \le R\text{)} .$$

We also use the fact that the time derivative of $\sin(\omega t)$ (where $\omega = 2\pi f = 2\pi(60) \approx 377$/s in this problem) is $\omega \cos(\omega t)$. Thus, we find the magnetic field as a function of r (for $r \le R$; note that this neglects "fringing" and related effects at the edges):

$$B = \frac{\mu_0 \varepsilon_0 r}{2d} V_{\max} \omega \cos(\omega t) \implies B_{\max} = \frac{\mu_0 \varepsilon_0 r V_{\max} \omega}{2d}$$

where $V_{\max} = 150$ V. This grows with r until reaching its highest value at $r = R = 30$ mm:

$$\begin{aligned} B_{\max}\Big|_{r=R} &= \frac{\mu_0 \varepsilon_0 R V_{\max} \omega}{2d} \\ &= \frac{(4\pi \times 10^{-7}\,\text{H/m})(8.85 \times 10^{-12}\,\text{F/m})(30 \times 10^{-3}\,\text{m})(150\,\text{V})(377/\text{s})}{2(5.0 \times 10^{-3}\,\text{m})} \\ &= 1.9 \times 10^{-12}\ \text{T} . \end{aligned}$$

(b) For $r \le 0.03$ m, we use the $B_{\max} = \frac{\mu_0 \varepsilon_0 r V_{\max} \omega}{2d}$ expression found in part (a) (note the $B \propto r$ dependence), and for $r \ge 0.03$ m we perform a similar calculation starting with the result of part (b)in Sample Problem 32-3:

$$\begin{aligned} B_{\max} &= \left(\frac{\mu_0 \varepsilon_0 R^2}{2r} \frac{dE}{dt} \right)_{\max} \\ &= \left(\frac{\mu_0 \varepsilon_0 R^2}{2rd} \frac{dV}{dt} \right)_{\max} \\ &= \left(\frac{\mu_0 \varepsilon_0 R^2}{2rd} V_{\max} \omega \cos(\omega t) \right)_{\max} \\ &= \frac{\mu_0 \varepsilon_0 R^2 V_{\max} \omega}{2rd} \qquad \text{(for } r \ge R\text{)} \end{aligned}$$

(note the $B \propto r^{-1}$ dependence – See also Eqs. 32-40 and 32-41). The plot (with SI units understood) is shown below.