(a) frequency is same as frequency of rotation, \( f \)

\[ \Phi_{B_{\text{max}}} = B \left[ A \sin \varphi + \frac{\pi a^2}{2} \right] \]

\[ \Phi_{B_{\text{min}}} = B \left[ A \sin \varphi - \frac{\pi a^2}{2} \right] \]

in general: \[ \Phi_B = B \left[ A \sin \varphi + \frac{\pi a^2}{2} \cos (2\pi ft) \right] \]

\[ |E| = \frac{d\Phi}{dt} = -B \frac{\pi a^2}{2} \cdot 2\pi f \sin (2\pi ft) \]

\[ E_{\text{max}} = B \frac{\pi a^2}{2} f \]