

67. (a) The radius of the cyclotron dees should be

$$r = \frac{m_p v}{qB} = \frac{(1.67 \times 10^{-27} \text{ kg})(3.00 \times 10^8 \text{ m/s})/10}{(1.60 \times 10^{-19} \text{ C})(1.4 \text{ T})} = 0.22 \text{ m} .$$

(b) The frequency should be

$$f_{\text{osc}} = \frac{v}{2\pi r} = \frac{3.00 \times 10^7 \text{ m/s}}{2\pi(0.22 \text{ m})} = 2.1 \times 10^7 \text{ Hz} .$$