21.47 The distance between adjacent antinodes in a standing wave is $\lambda/2$

Thus, $\lambda = 2(6.00\ \text{cm}) = 12.0\ \text{cm} = 0.120\ \text{m}$, and

$$c = \lambda f = (0.120\ \text{m})(2.45\times10^{9}\ \text{Hz}) = \boxed{2.94\times10^{8}\ \text{m/s}}$$

21.51 (a) For the AM band,

$$\lambda_{min} = \frac{c}{f_{max}} = \frac{3.00\times10^{8}\ \text{m/s}}{1600\times10^{3}\ \text{Hz}} = \boxed{188\ \text{m}}$$

$$\lambda_{max} = \frac{c}{f_{min}} = \frac{3.00\times10^{8}\ \text{m/s}}{540\times10^{3}\ \text{Hz}} = \boxed{556\ \text{m}}$$

(b) For the FM band,

$$\lambda_{min} = \frac{c}{f_{max}} = \frac{3.00\times10^{8}\ \text{m/s}}{108\times10^{6}\ \text{Hz}} = \boxed{2.78\ \text{m}}$$

$$\lambda_{max} = \frac{c}{f_{min}} = \frac{3.00\times10^{8}\ \text{m/s}}{88\times10^{6}\ \text{Hz}} = \boxed{3.4\ \text{m}}$$