

①

$$\lambda = 500 \text{ nm} = 500 \times 10^{-9} \quad d = 0.1 \text{ mm} = 1 \times 10^{-4} \text{ m}$$

two-slit constr.

one-slit destr.

$$y_5 = \frac{(5) 500 \times 10^{-9} (3.45)}{1 \times 10^{-4}} = y_1 = \frac{(1) 500 \times 10^{-9} (3.45)}{a}$$

$$a = \frac{1 \times 10^{-4} \text{ m}}{5} = \underline{\underline{2 \times 10^{-5} \text{ m}}}$$

$$y_{\frac{1}{2}} = \frac{(\frac{1}{2}) 500 \times 10^{-9} (3.45)}{1 \times 10^{-4}} \quad \text{first destr. double slit}$$

$$= \underline{\underline{.0086 \text{ m}}} = .86 \text{ cm}$$

$$\theta = \frac{y}{L} = \frac{.0086}{3.45} = .0025 \text{ radians}$$

(or $.143^\circ$)

$$f\lambda = c$$

$$f = \frac{c}{\lambda} = \frac{3 \times 10^8}{500 \times 10^{-9}} = \underline{\underline{6 \times 10^{14} \text{ Hz}}}$$