

Ch. 1 Prob. 3/

$$n = 1.55$$

$$\Delta x = 0.200 \text{ m}$$

Find The time in nanoseconds to transmit a signal through The optic fiber.

$$\text{Since } n = \frac{c}{v} \rightarrow v = \frac{c}{n}$$

$$v = \frac{3.00 \times 10^8 \text{ m/s}}{1.55} = 1.94 \times 10^8 \text{ m/s}$$

$$\text{Since } \Delta x = v \cdot \Delta t$$

$$\text{Then } \Delta t = \frac{\Delta x}{v} = \frac{0.200 \text{ m}}{1.94 \times 10^8 \text{ m/s}}$$

$$\Delta t = 1.03 \times 10^{-9} \text{ s}$$

$$= \boxed{1.03 \text{ ns}}$$