

34. After passing through the first polarizer the initial intensity  $I_0$  reduces by a factor of  $1/2$ . After passing through the second one it is further reduced by a factor of  $\cos^2(\pi - \theta_1 - \theta_2) = \cos^2(\theta_1 + \theta_2)$ . Finally, after passing through the third one it is again reduced by a factor of  $\cos^2(\pi - \theta_2 - \theta_3) = \cos^2(\theta_2 + \theta_3)$ . Therefore,

$$\begin{aligned}\frac{I_f}{I_0} &= \frac{1}{2} \cos^2(\theta_1 + \theta_2) \cos^2(\theta_2 + \theta_3) = \frac{1}{2} \cos^2(50^\circ + 50^\circ) \cos^2(50^\circ + 50^\circ) \\ &= 4.5 \times 10^{-4}.\end{aligned}$$

Thus, 0.045% of the light's initial intensity is transmitted.