Consider the setup shown. Incident beam with intensity $I_0$ is polarized along the $y$–axis. Assume #1 transmission axis is $30^\circ$ with respect to the $y$–axis, and that of #2 is along the $x$–axis.

Find the final intensity $I_2$.

A) $I_2 = \frac{3 I_0}{16}$.

B) $I_2 = \frac{3 I_0}{8}$.

C) $I_2 = \frac{I_0}{4}$.

D) $I_2 = \frac{I_0}{2}$.

Polarized light $I = I_0 \cos^2 \alpha$.

$$I_1 = I_0 \cos^2 30^\circ = \frac{3 I_0}{4}. $$

$$I_2 = I_1 \cos^2 60^\circ = \frac{3 I_0}{16}. $$

Answer **A**.