5. Skoog 7-10

We use the relation \( \lambda = \frac{2 \pi n}{\sin \theta} \)

\[ t = \frac{n \lambda}{2 \pi} \]

Assume we work in 1st order \( (n=1) \).

The wedge will have a dielectric sandwiched between metal plates. It will increase in thickness linearly from

\[ t = \frac{(1)(400\text{nm})}{2(1.32)} = 152\text{nm} \]

at 0.0 cm to

\[ t = \frac{(1)(700\text{nm})}{2(1.32)} = 265\text{nm} \]

at 10.0 cm.

**Note:** Answer in back of book is partially wrong

6. Skoog 7-14

\( n \lambda = d (\sin \theta + \sin \phi) \Rightarrow \lambda = \frac{d}{n} (\sin \theta + \sin \phi) \)

(a) \( \lambda = \left( \frac{\text{m}}{32.0} \right) \left( \frac{1}{2} (\sin 50^\circ + \sin 20^\circ) \right) \left( 10^3 \frac{\text{nm}}{\text{mm}} \right) = 15.4 \text{um; 1st order} \)

\[ 7.69 \text{um; 2nd order} \]

(b) \( \lambda = \left( \frac{\text{m}}{32.0} \right) \left( \frac{1}{2} (\sin 50^\circ + \sin 60^\circ) \right) \left( 10^3 \frac{\text{nm}}{\text{mm}} \right) = 10.6 \text{um; 1st order} \)

\[ 5.32 \text{um; 2nd order} \]