Given that,

$\theta_1 = 65.0^\circ$

$\lambda_1 = 530\ nm = 590 \times 10^{-9}\ m$

$\lambda_2 = 700\ nm = 700 \times 10^{-9}\ m$

We know, angular position of a bright band is given by,

$$\sin\theta_m = \frac{m\lambda}{d}$$

For the third order bright band, in the first wavelength λ_1 : wherese $m = +3$.

$$\sin\theta_3 = \frac{3\lambda_1}{d}$$

$$\Rightarrow d = \frac{3\lambda_1}{\sin\theta_3}$$

$$\Rightarrow d = \frac{3 \times 530 \times 10^{-9}}{\sin 65^\circ}$$

$$\therefore d = 1.75 \times 10^{-6}\ m$$

$$\sin\theta_2 = \frac{2\lambda_2}{d}$$

Hence,

$$\theta_2 = \sin^{-1}\left[\frac{2\lambda_2}{d}\right]$$

$$\Rightarrow \theta_2 = \sin^{-1}\left[\frac{2 \times 700 \times 10^{-9}}{1.75 \times 10^{-6}}\right]$$

$$= 53.130^\circ$$

Ans!