Chapter 16

Q4 The velocity is the common characteristic of all electromagnetic waves. Thus, the frequency and wavelength must vary.

Q11 The sky light is a result of the color of the scattered sun light, mostly blue, while sun light is perceived to contain all wavelengths, thus white.

Q16 The thin film is the air gap between the plates.

Q25 A polarizing filter absorbs light whose electric field is perpendicular to the transmission direction. Hence, the transmitted light is weaker.

E4 $3 \times 10^{18}$ Hz

E9 a. One-half wavelength  
    b. Destructive interference

E10 a. 2.4 mm (see page 336 in text)  
    b. 4.8 mm

E13 a. 27.3 cm (see page 338 in text)  
    b. 54.6 cm

SP1 a. Violet: $7.89 \times 10^{14}$ Hz  
      Red: $4.0 \times 10^{14}$ Hz  
    b. $200 \times 10^6$ m/s  
    c. Violet: 253 nm  
      Red: 500 nm

SP2 a. 24 mm  
    b. 48 mm  
    c. 12 mm  
    d. The center bright fringe is found at $y = 0$, and the other six central bright fringes are found at $y = \pm 24$ mm, $\pm 48$ mm, and $\pm 72$ mm.