

**8.27** A 2 km long optical fiber uses a fiber core with  $n_f = 1.6$  and a cladding with  $n_c = 1.57$ . Compute the maximum data rate and confirm your result using Module 8.2. The operating frequency is 100 THz.

**Solution:** From Eq. (8.45),

$$f_p = \frac{cn_c}{2ln_f(n_f - n_c)}$$

$$= \frac{3 \times 10^8 \times 1.57}{2 \times 2 \times 10^3 \times 1.6(1.6 - 1.57)} = 2.453 \text{ (Mbits/s)}.$$

The same result is obtained using Module 8.2.

