Problem 7.17

(a) Examining the continuous phase FSK waveform plotted in Fig. 7.1(c), we observe the following two points (assuming that time t is measured in seconds):

    (i) The carrier for symbol 00 occupies 3 complete cycles. Therefore,

$$f_2 = \frac{1}{(2 \text{ seconds})/(3 \text{ cycles})} = 1.5 \text{ Hz}$$

    (ii) The carrier for symbol 11 occupies 5 complete cycles. Therefore,

$$f_1 = \frac{1}{(2 \text{ seconds})/(5 \text{ cycles})} = 2.5 \text{ Hz}$$

Hence, the frequency excursion is

$$\delta f = f_1 - f_2$$
$$= 2.5 - 1.5 = 1 \text{ Hz}$$

(b) The frequency parameter f_0 is defined by (see Eq. (7.34))

$$f_0 = \frac{1}{4T_b}$$

$$= \frac{1}{4 \times 1 \ \mu s} = 0.25 \text{ MHz}$$