Example 2.6

FM broadcast station is allowed to have a frequency deviation of 75 kHz. If a 4 kHz (highest voice frequency) audio signal causes full deviation (i.e. at maximum amplitude of information signal) , calculate the modulation index .

deviation ratio

Solution :

$$\text{Modulation index}, \quad m_f = \frac{\Delta f}{f_m} = \frac{75\ kHz}{4\ kHz} = \underline{18.75}$$

Example 2.7:

Determine the peak frequency deviation, Δf, and the modulation index, m_f , for an FM modulator with a deviation sensitivity $k_f = 10$ kHz / V. The modulating signal to be transmitted is, $\upsilon_m(t) = 5 \cos (10k\pi t)$.

Solution :

Peak frequency deviation,

$$\Delta f = k_f \times Vm$$

$$= 10\ kHz/V \times 5\ V$$

$$= \underline{50kHz}$$

Modulation index,

$$m_f = \Delta f\ /\ fm$$

$$= 50kHz\ /\ 5kHz$$

$$= \underline{10}$$