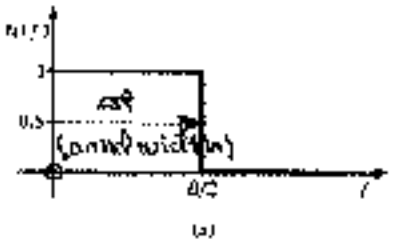
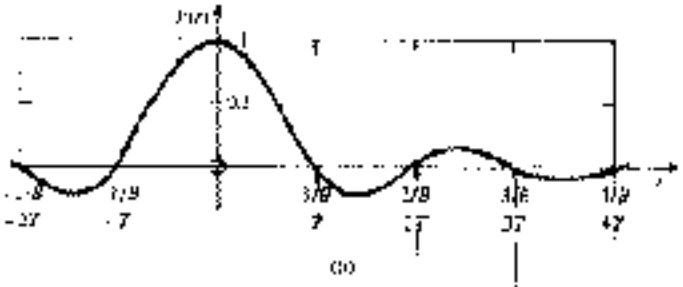
Filtering to Reduce Bandwidth

Ideal Low-Pass



(a)

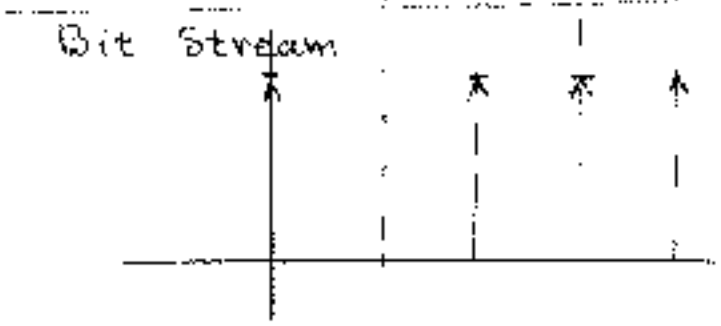


(b)

Fig. 15.4 Ideal low-pass filter:
(a) frequency response $H(f) = \begin{cases} 1 & |f| < B/2 \\ 0 & |f| > B/2 \end{cases}$
(b) impulse response $h(t) = \left| \frac{\sin \pi B t}{\pi B} \right|$

The corresponding impulse response is

$$h(t) = \left| \frac{\sin(\pi B t)}{\pi B} \right|$$



Minimized inter symbol interference

Thus bit-rate = $B = 2f$

Problem! Not realizable

Block Diagram of Typical Digital Optical Receiver