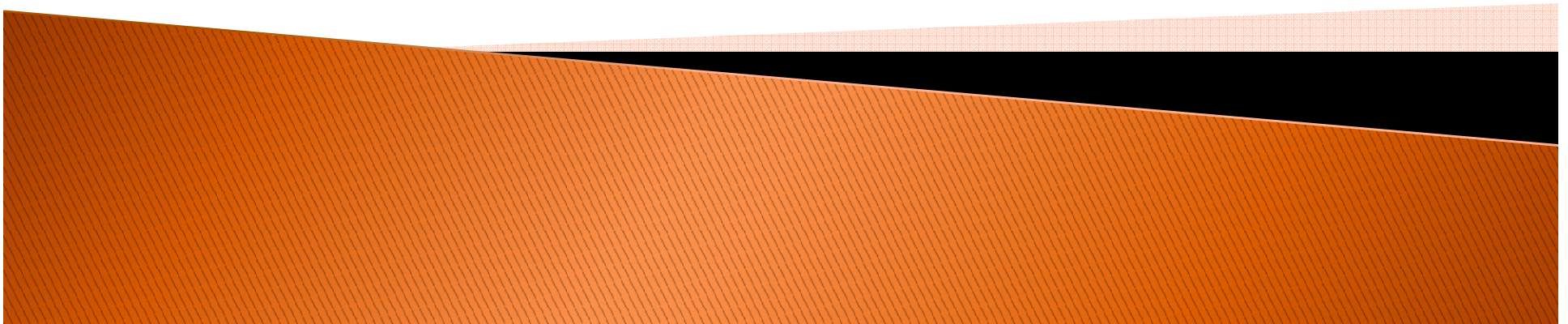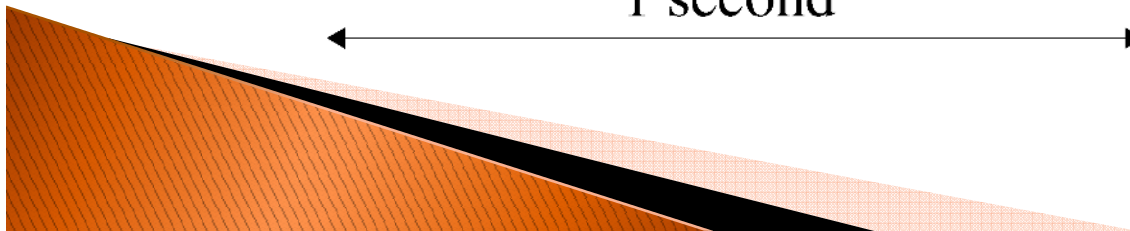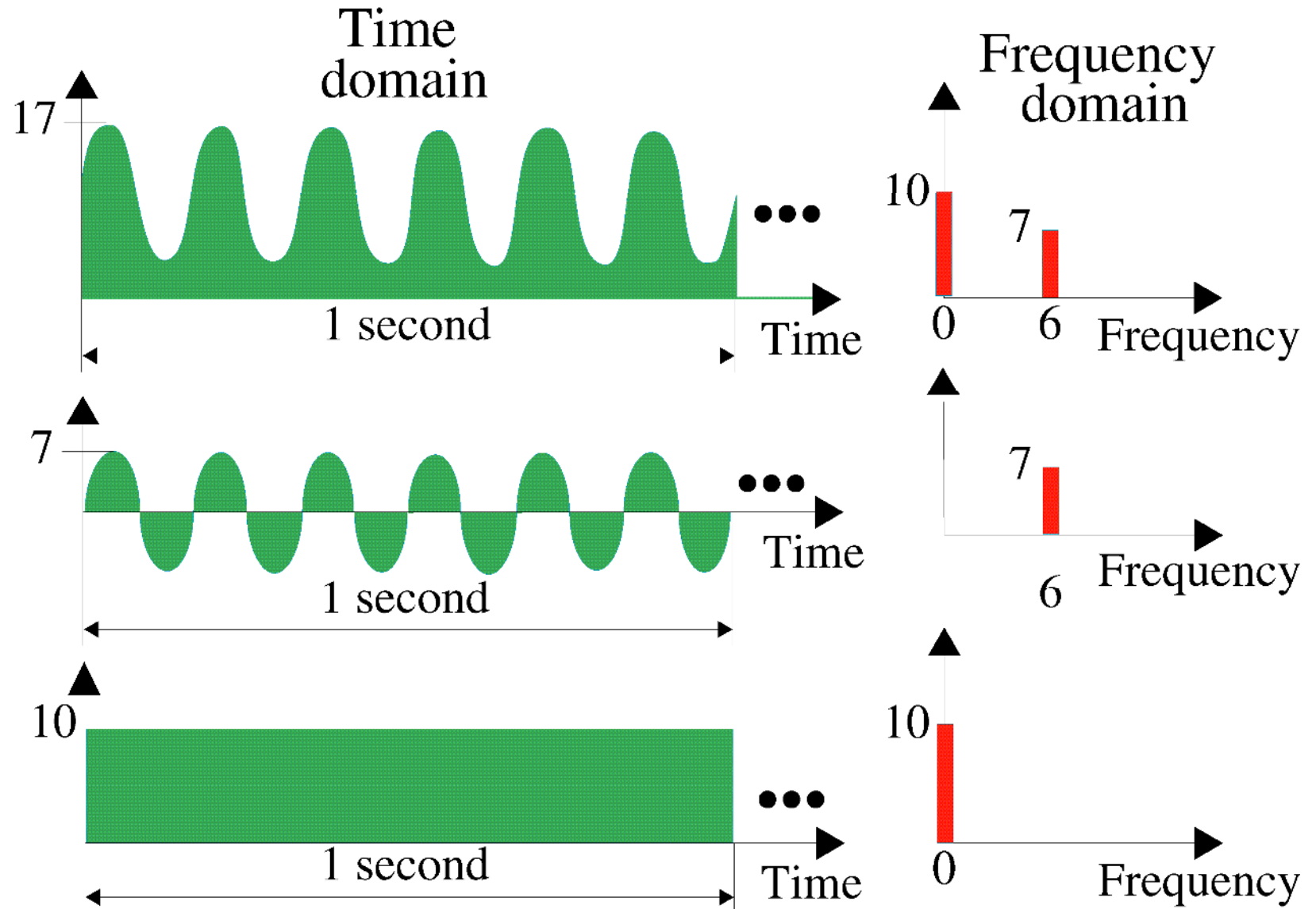# Computer Organization and Architecture
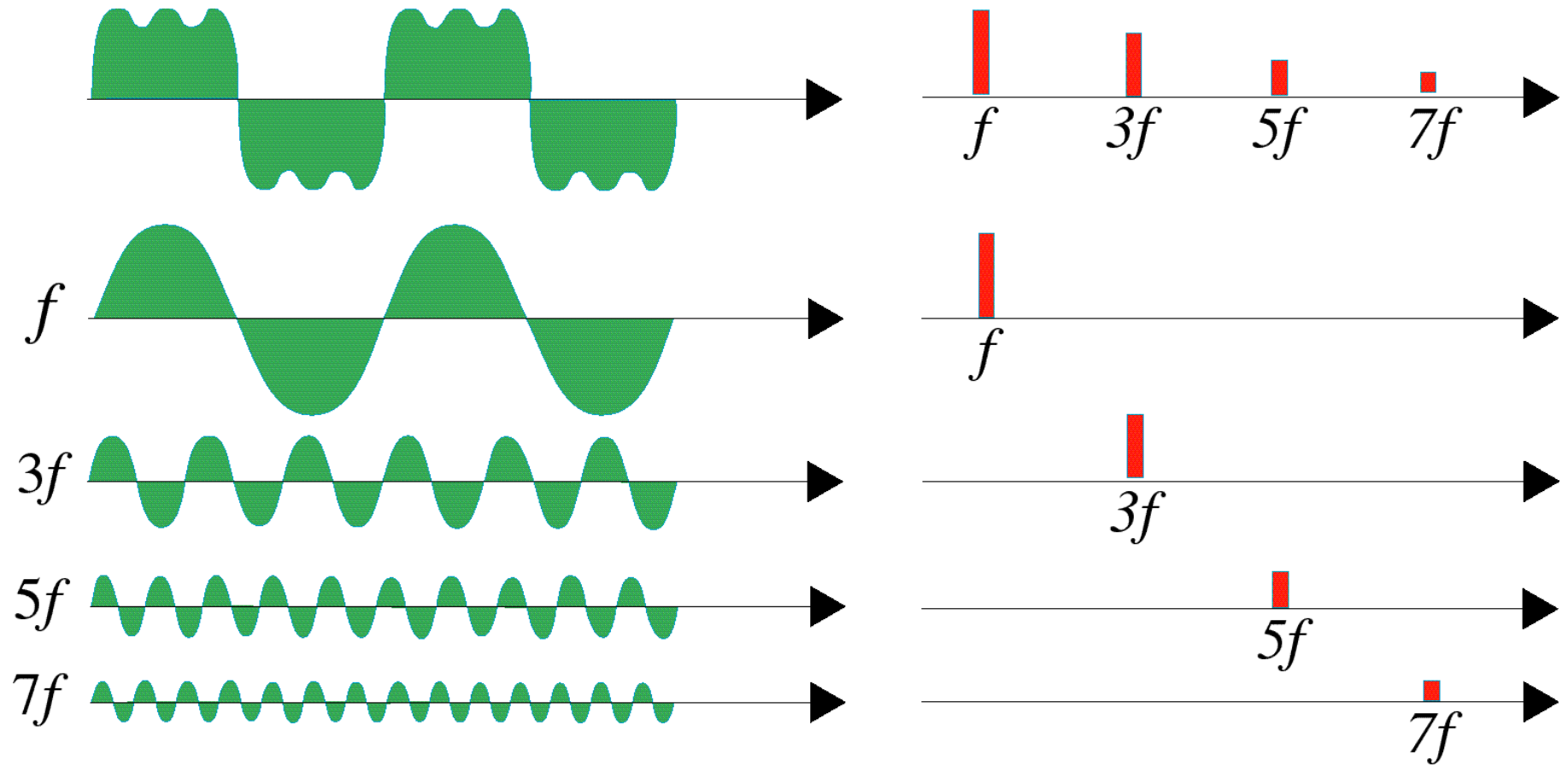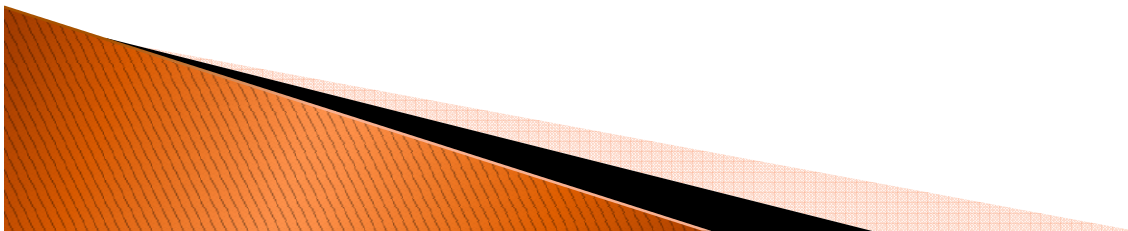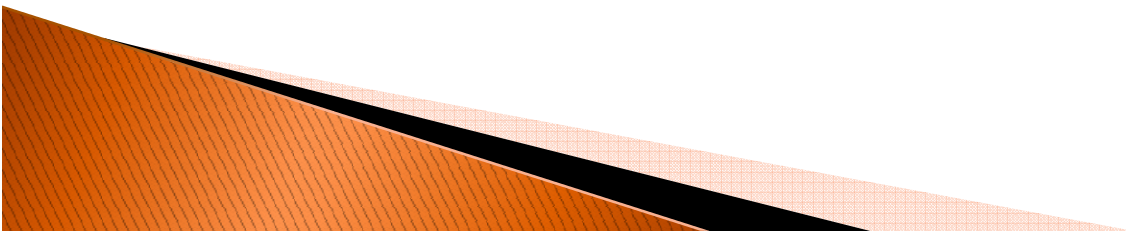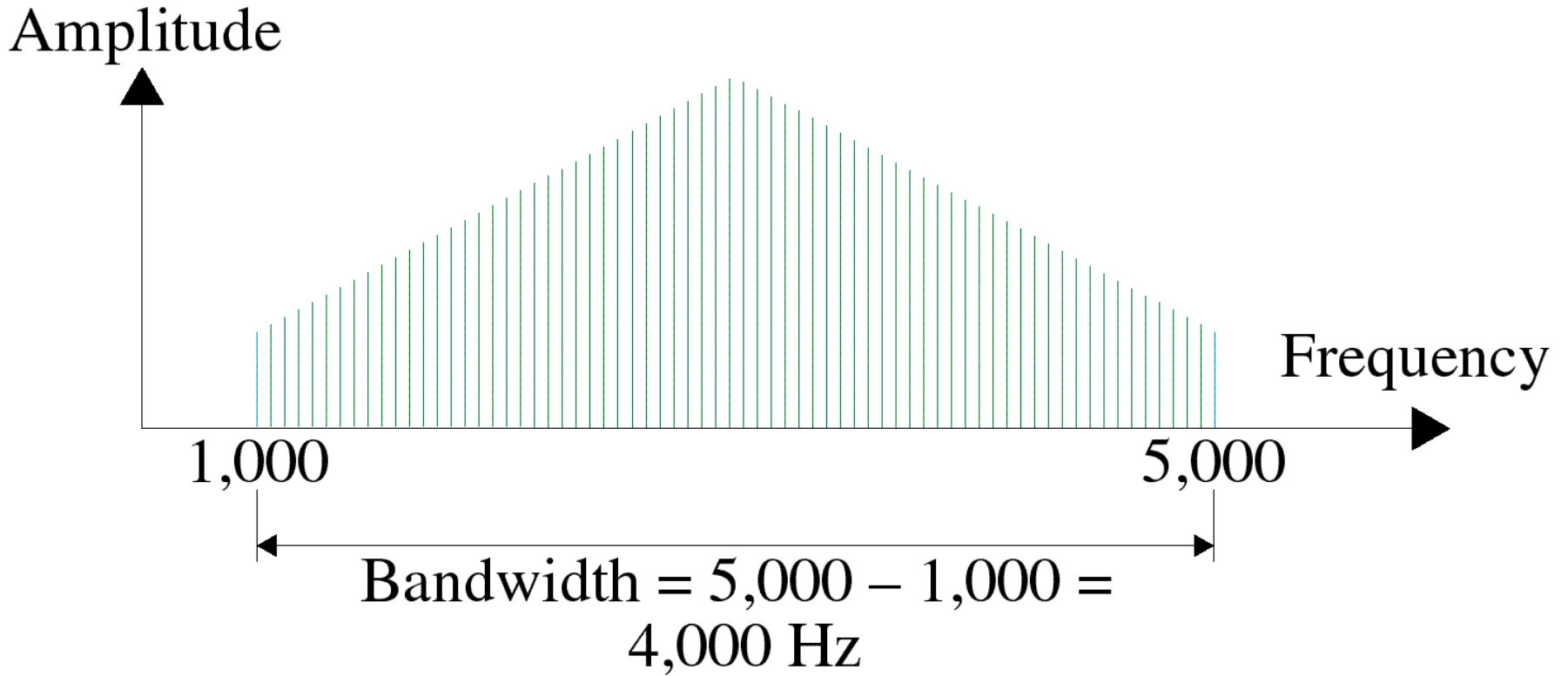
Magi Thomas
BCA

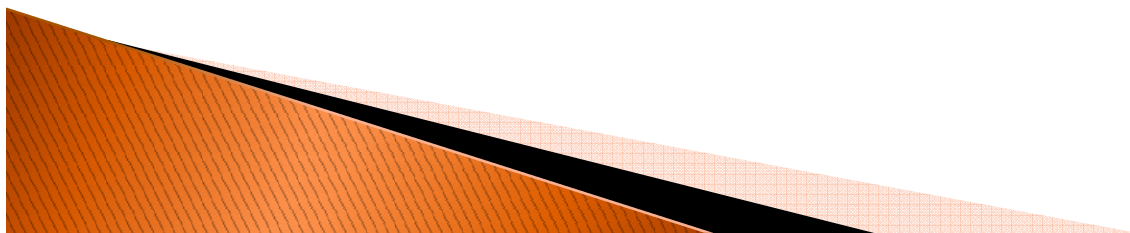# Signal with DC Component

Complex Waveform

a. Time domain   b. Frequency domain

Bandwidth

Amplitude

Frequency

1,000

5,000

Bandwidth = 5,000 − 1,000 = 4,000 Hz
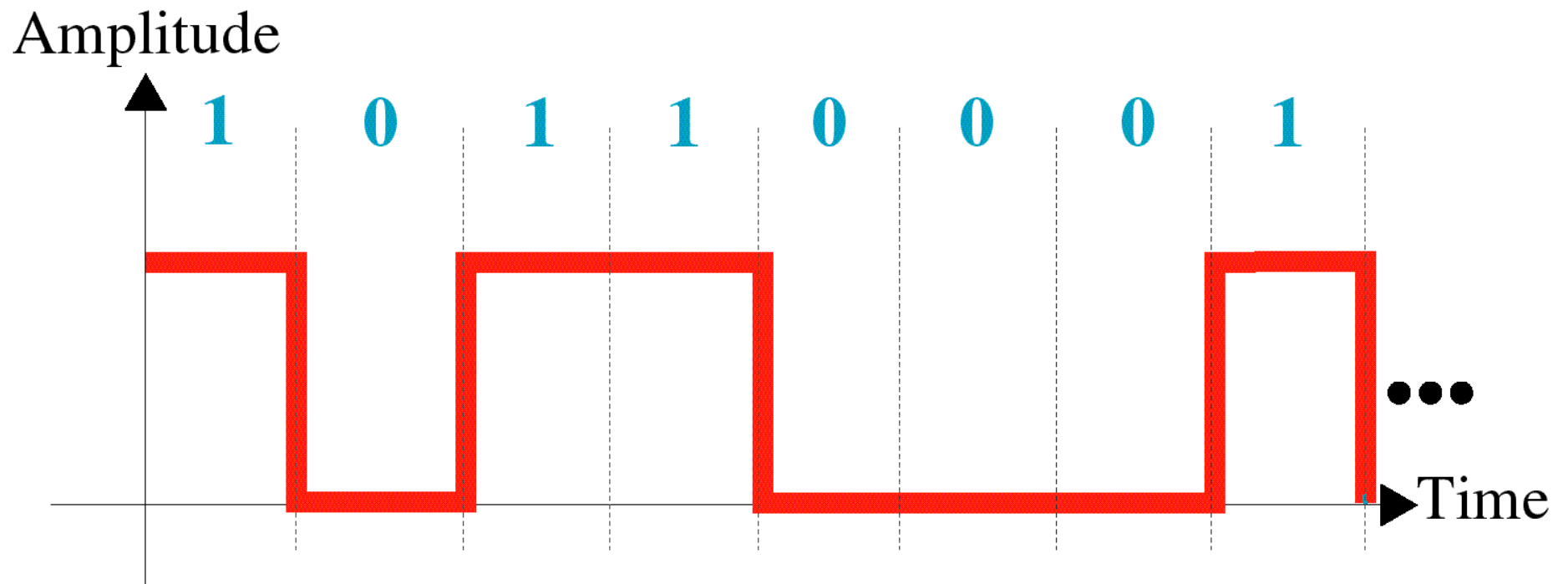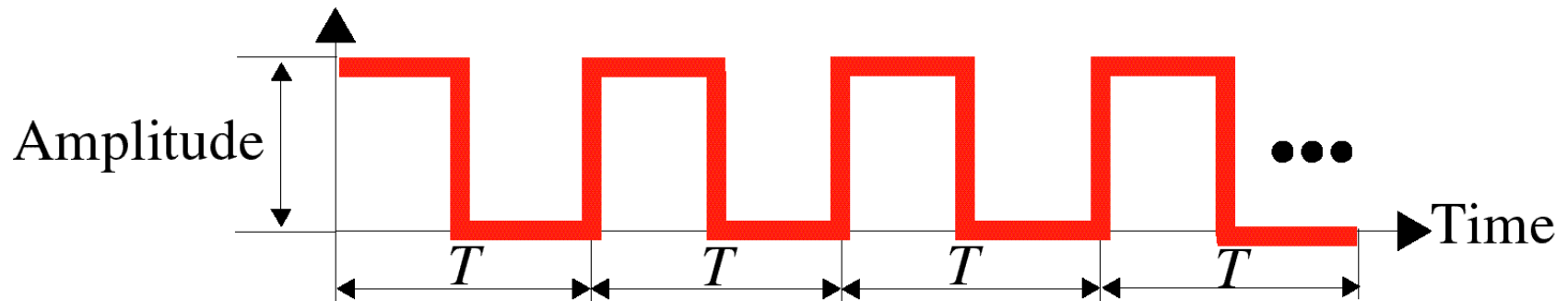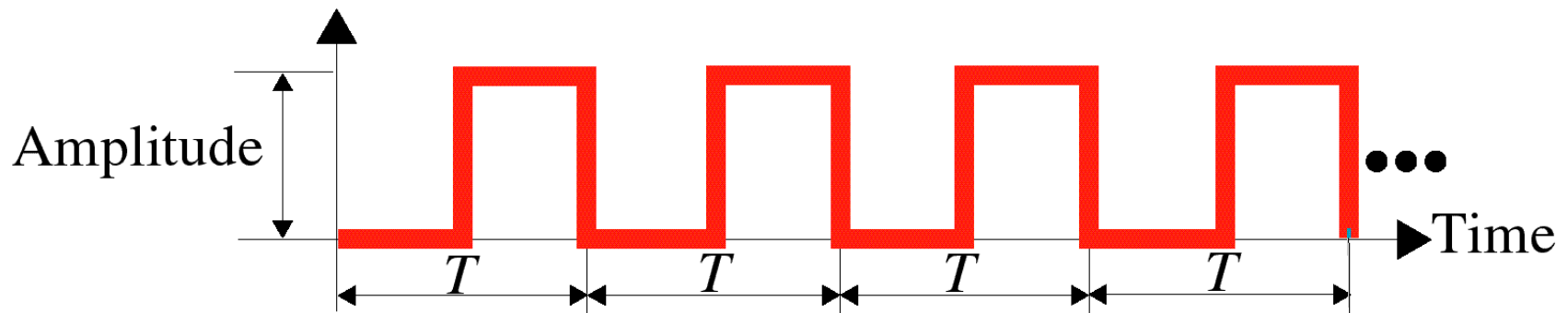
Digital Signal

Amplitude, Period, and Phase for a Digital Signal

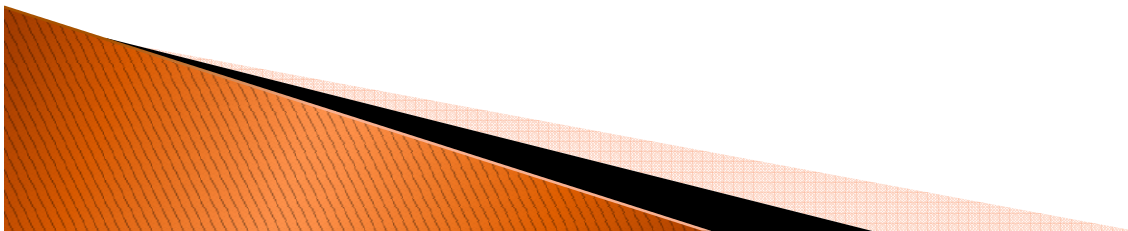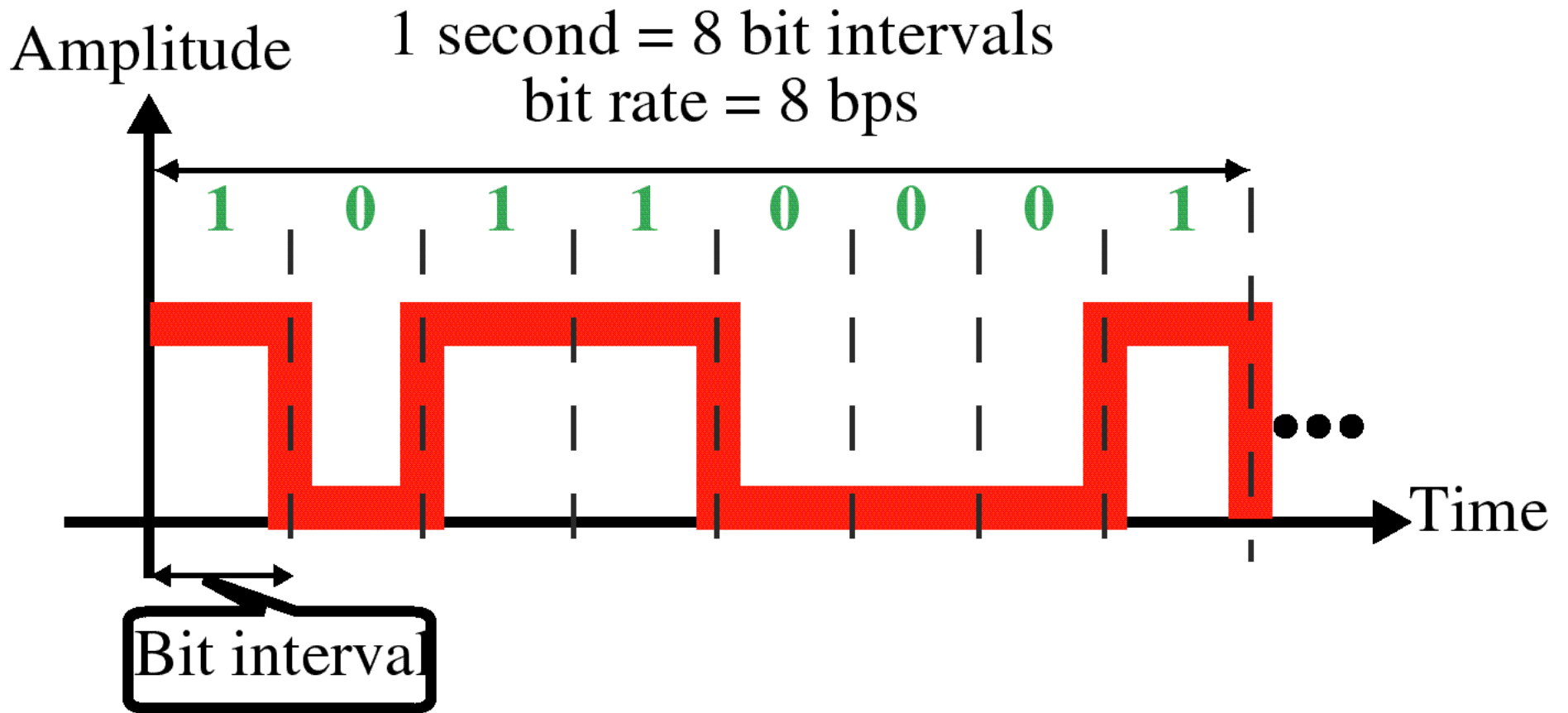Amplitude

T   T   T   T

Time

a. No phase shift
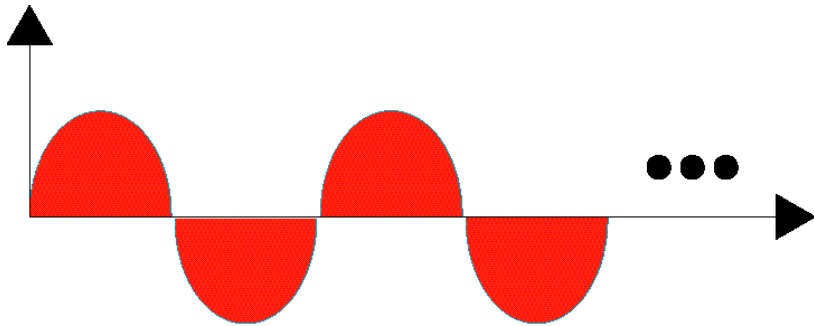
Amplitude

T   T   T   T
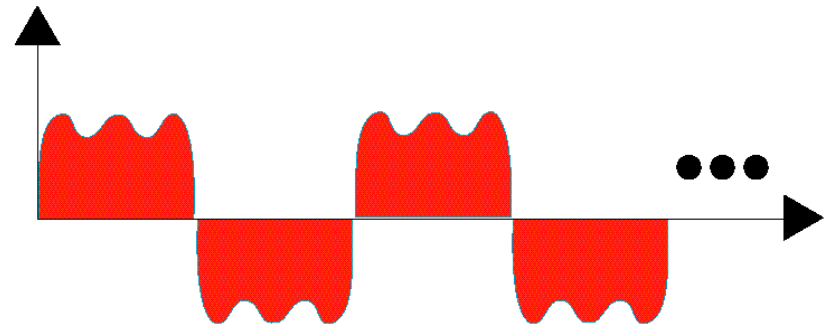
Time

b. 180 degree phase shift
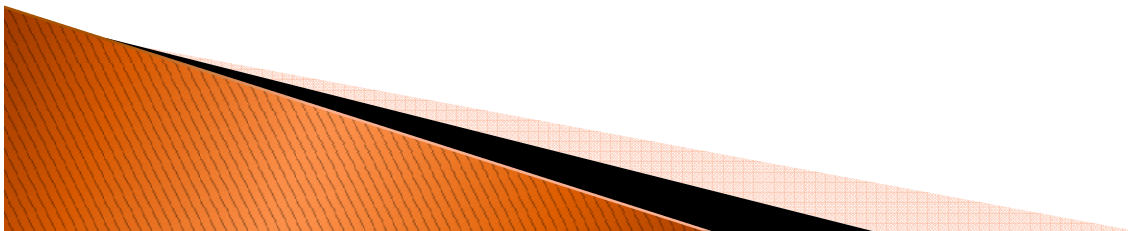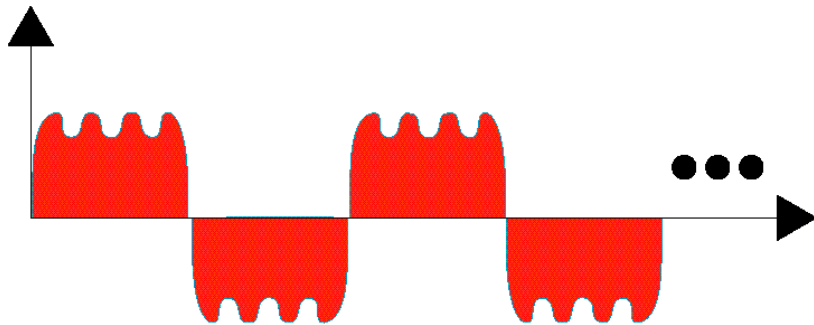
Bit Rate and Bit Interval
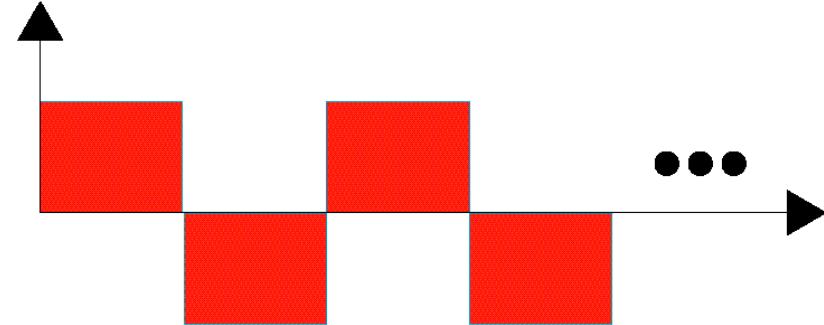
Harmonics of a Digital Signal
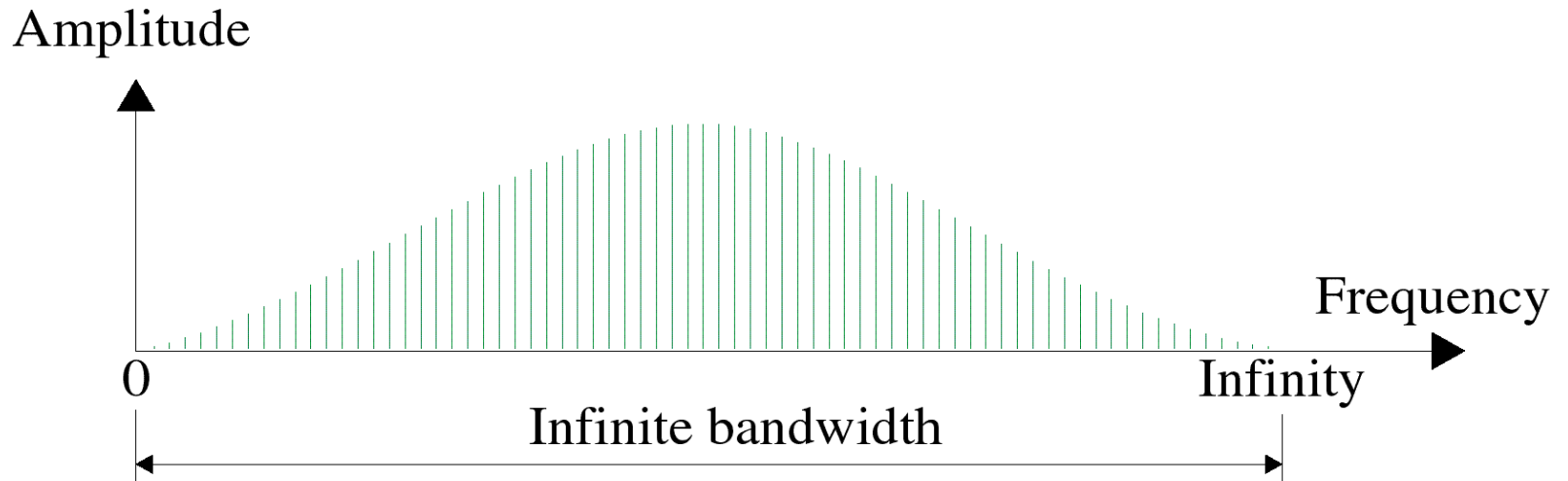

a. Only first harmonic

b. First, third, and fifth harmonics
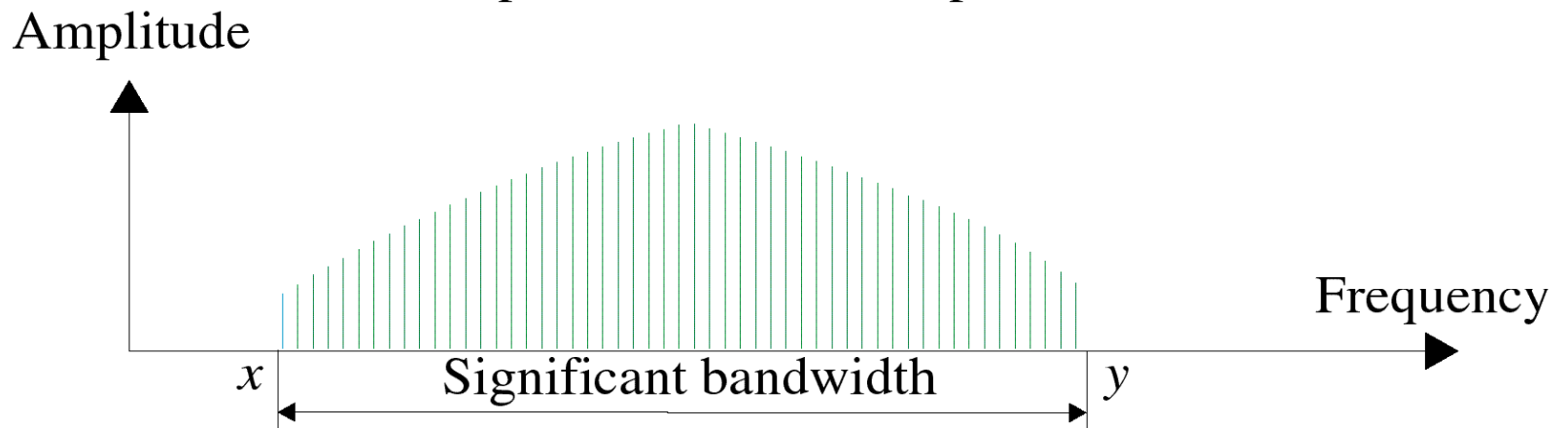
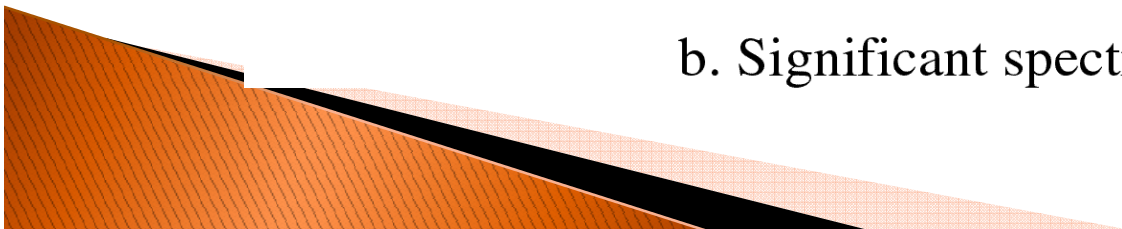c. First, third, fifth, and seventh harmonics

d. Infinite number of harmonics

Exact and Significant Spectrums

Amplitude

Frequency

0

Infinity

Infinite bandwidth

a. Spectrum for exact replica

Amplitude

Frequency

x

Significant bandwidth

y
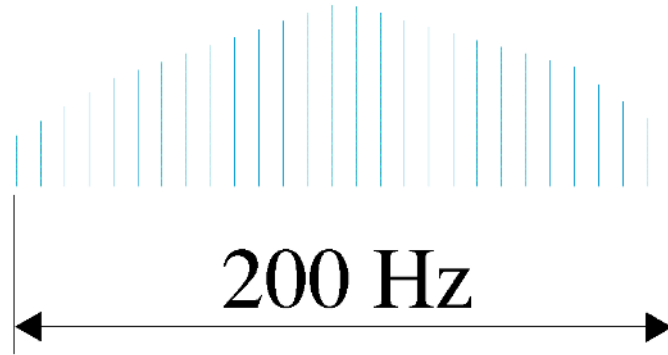
b. Significant spectrum

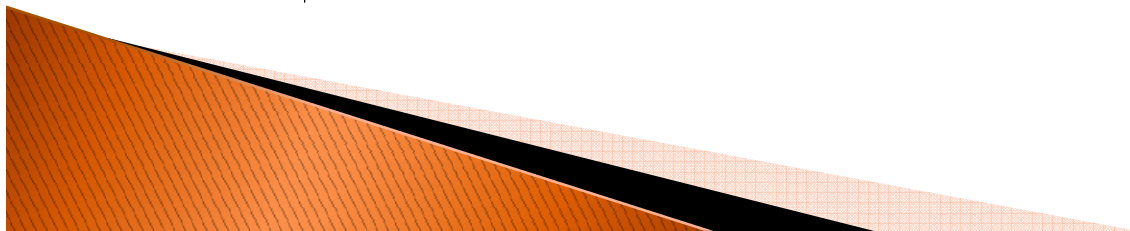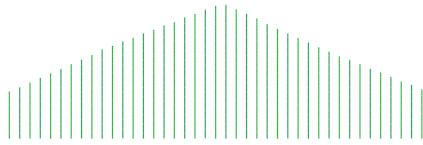# Bit Rates and Significant Spectrums
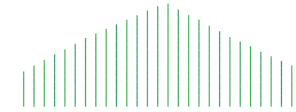

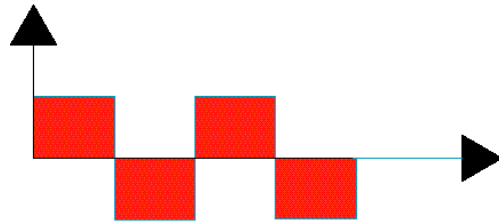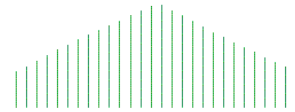1000 bps

200 Hz

2000 bps

400 Hz
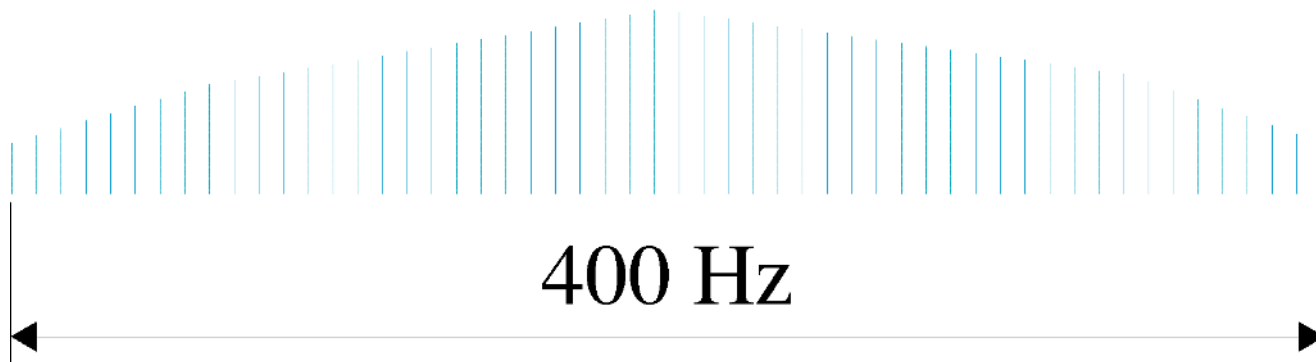
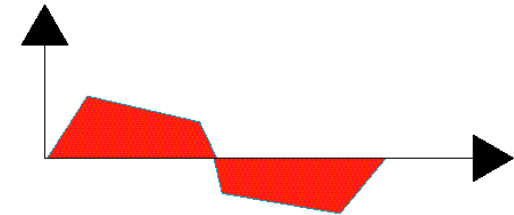# Corruption Due to Insufficient Bandwidth
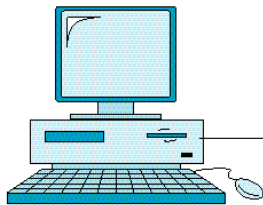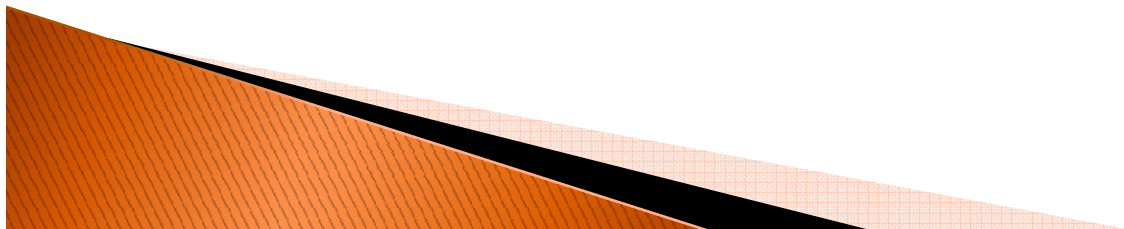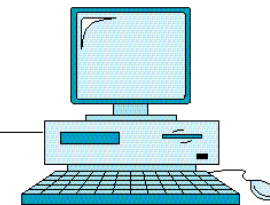

Significant spectrum

Received spectrum
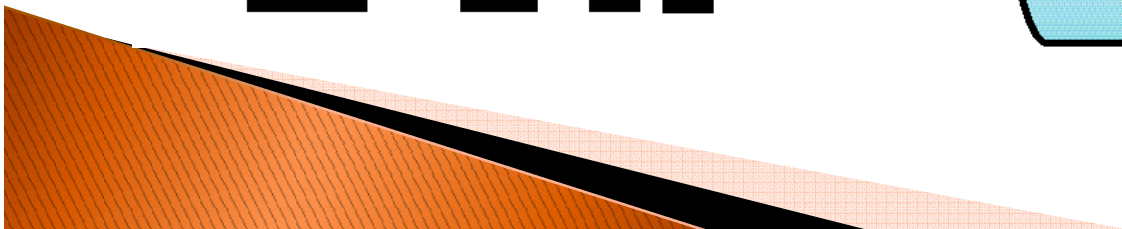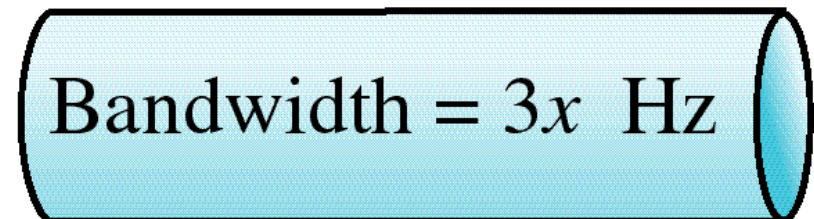
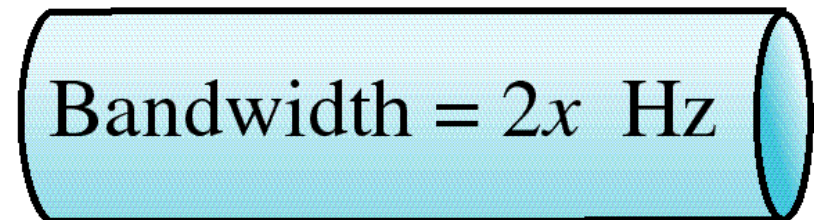Medium bandwidth

Original signal

Received spectrum

Transmission medium

Bandwidth and Data Rate

Bit rates   **Transmission medium**

a. 1000 bps

Bandwidth = x Hz

b. 2000 bps

Bandwidth = $2x$ Hz

c. 3000 bps

Bandwidth = $3x$ Hz

THANK YOU