Tutorial 12

Question 1

An analog transmission system has the source, the destination, and a number of repeaters. Each transmission segment adds noise to the signal. Assume that each repeater recovers the original signal without distortion but that the noise accumulates. At the first repeater, SNR = 40 dB. What is the SNR after 9 repeater links?

Question 2

A speech signal has a bandwidth of 8 KHz.

(a) If the speech signal is digitized and transmitted over a 64 Kbps modem. What is the SNR of the received speech signal?

(b) What modem speed is needed if we require an SNR of 40 dB?

Question 3

Suppose that a low-pass communication system has the bandwidth of 1.5 MHz with 16-level signaling.

(a) Can the pulse signal be transmitted reliably through the channel with the SNR of 20 dB? Why?

(b) Can the pulse signal be transmitted reliably through the channel with the SNR of 30 dB? Why?