جامعة الأهرام الكندية
AHRAM CANADIAN UNIVERSITY

Data Communication Tutorial 01.P1
Data Transmission

1. Express a period of 100 ms in microseconds, and express the corresponding frequency in kilohertz

2. A sine wave is offset one-sixth of a cycle with respect to time zero. What is its phase in degrees and radians?

3. If a periodic signal is decomposed into five sine waves with frequencies of 100, 300, 500, 700, and 900 Hz, what is the bandwidth? Draw the spectrum, assuming all components have a maximum amplitude of 10 V.

4. A signal has a bandwidth of 20 Hz. The highest frequency is 60 Hz. What is the lowest frequency?

5. A signal has a spectrum with frequencies between 1000 and 2000 Hz (bandwidth of 1000 Hz). A medium can pass frequencies from 3000 to 4000 Hz (a bandwidth of 1000 Hz). Can this signal faithfully pass through this medium?

6. A digital signal has a bit rate of 2000 bps. What is the duration of each bit (bit interval)

7. Assume spectrum of a channel is between 3 MHz and 4 MHz and the SNR is 24 dB, find data rate

8. Consider an extremely noisy channel in which the value of the signal-to-noise ratio is almost zero.
In other words, the noise is so strong that the signal is faint.
For this channel the calculate capacity ?

9. We can calculate the theoretical highest bit rate of a regular telephone line. A telephone line normally has a bandwidth of 3000 Hz (300 Hz to 3300 Hz). The signal-to-noise ratio is usually 3162. For this channel calculate the capacity

10. We have a channel with a 1 MHz bandwidth. The SNR for this channel is 63; what is the appropriate bit rate and signal level?