**King Saud University**

**College Of Computer & Information Sciences**

**Department Of Computer Sciences**

**Tutorial 3 Fall 15**

**(Computer Networks CSC 329)**

1. Explain the advantage of communication with optical fiber as a physical media.
2. Explain the concept of modulation/ demodulation
3. Explain the concept of frequency multiplexing and time multiplexing channels.

1. Give and explain the Shannon and Nyquist theorems
2. Consider a noiseless channel with a bandwidth of 3000 Hz transmitting a signal with two signal levels. Calculate the maximum bit rate for this channel?
3. Consider the same noiseless channel transmitting a signal with four signal levels (for each level, we send 2 bits). Calculate the maximum bit rate for this channel?
4. Calculate the theoretical highest bit rate of a regular telephone line that has a bandwidth of 3000? The signal-to-noise ratio is usually 3162.
5. The signal-to-noise ratio is often given in decibels. Assume that SNRdB = 36 and the channel bandwidth is 2 MHz. calculate the theoretical channel capacity?