جـــامعة المشـــرق

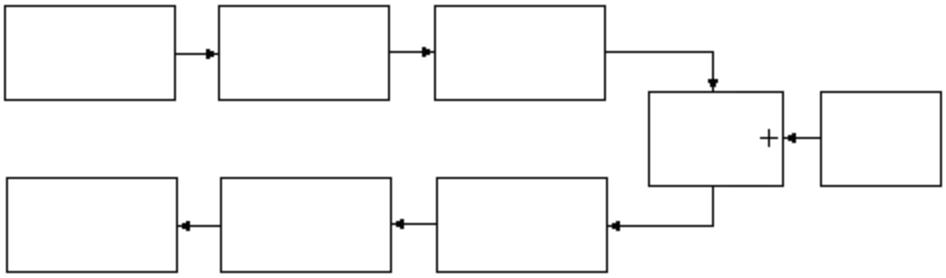
جامعة المشرق
Mashreq University

إمتحانات نهاية الفصل الدراسي الثاني للعام 2013-2014م

Sub: Communication Engineering - II	Dep: Engineering	Class: 4th
Time: 3 hours	No of Page:2	Date: / /2014

Q1:

1. Fill in the blocks of the following general communication system. Describe shortly the causes/reasoning/usage of each part.



2. Write short note on:
   a. PCM b. Spectrum Frequency

Q2:

1. Define the information ***I(S)*** and Entropy ***H(s)***.
2. What is SNR?We have a channel with 4 KHz bandwidth. If we want to send data at 100 Kbps, what is the minimum SNR [dB]?
3. We measure the performance of a telephone line (4 KHz) of bandwidth. When the signal is 10V,the noise is 5mV. What is the maximum data rate supported by this telephone line?

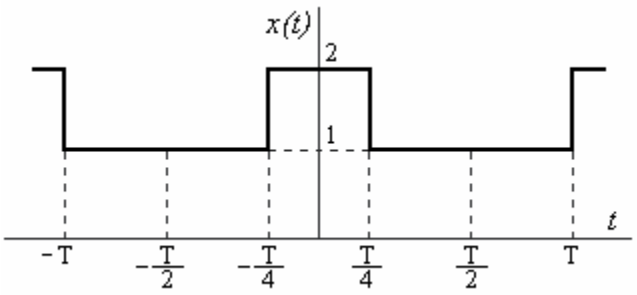
Q3:

1. The binary sequence 1011101010 is applied to the DPSK transmitter:
   i. Sketch the resulting waveform at the transmitter output
   ii. Applying this waveform to the DPSK receiver, show that, in the absence of noise, the original binary sequence is reconstructed at the receiver output.
2. Draw the data stream [0011001110111101] with graph of following schemes.

   (a) Unipolar NRZ (e) Manchester (f) AMI

Q4:

1. Draw the estimated (or calculated) frequency spectrum of the following periodic Waveform



2. Describe the concept of Equalizer.
3. An appropriately shaped symbol with zero-crossings at t = ±T, ±2T, ±3T, etc. relative to the center is distorted by the frequency-response of a wired channel. It is estimated, by averaging over several training symbols, that when the received symbol, x(t) say, is normalized to 1 volt at its center (assumed to occur at t=0), its voltages at t = ±T and ±2T relative to the center would be as follows in the absence of channel noise:

   $x(-2T) = 0.2,\ x(-T) = -0.3,\ x(0) = 1.0,\ x(T) = 0.4,\ x(2T) = -0.1$

   Inter-symbol interference is to be reduced by a 3-term 'zero-forcing' transversal equalizer. Explain how this may be achieved and give a diagram of the equalizer.

Dr. Ahmed Hassan, 2014

Good Luk