**KFUPM**-EE DEPT.

EE573- Digital Communications II

**Dr. Ali Muqaibel**

Assignment # 4: Equalization

 Ver. 3.0

1. Binary PAM is used to transmit information over an unequalized linear filter channel. When $a=1$ is transmitted, the noise-free output of the demodulator is

$$x\_{m}=\left\{\begin{matrix}\begin{matrix}0.3&m=1\\0.9&m=0\end{matrix}\\\begin{matrix}0.3&m=-1\\0&otherwise\end{matrix}\end{matrix}\right.$$

1. Design a three taps zero forcing equalizer.
2. Design a three taps equalizer using the MSE as the criterion fot optimizing the tap coefficients. Assume that the noise power spectral density is 0,1 W/Hz.
3. Evaluate the peak distortion criteria before and after equalization(for the above two equalizer) and comments

From *Digital communications* (Fifth Edition) by John Proakis and Masoud Salehi,

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| **Serial** | **Problem** | **Notes** |
| 2 | 9.35 | The objective of this problem is to understand the impact of the channel through link budget analysis.*d) How many repeaters are required?* |
| 3 | 9.53 |  |
| 4 | 9.55 | Part (e) is not included. |
| 5 | 10.1 | Part (a) & (b) only.Read section 10.1-3 About convergence properties of the LMS algorithm. |

**Instruction:**

* For this homework, every two will work as one team and submit one solution (same grade).
* Please start early to be able to meet the submission time.

"A teacher is one who makes himself progressively unnecessary."
-- Thomas Carruthers