1) A transmission line of length D with resistance r, conductance g, inductance l and capacitace c per unit length, find the expression of voltage, current and input impedance distributed along the line. The output is shorted.

2) A symmetrical triangular waveform has a peak amplitude of 1 V and a period T.
   a) Find the power spectral density (assume one ohm).
   b) Determine the mean-square value from the power spectral density.
   c) Determine the mean-aquare value in the time domain.

3) Prove that the impulse response of a matched filter to the input signal f(t) is
$$h(t)= kf^{*}(t_{m}-t).$$
where k is a constant.

4) A random variable X is uniformly distributed over (0,2) and is applied to the input of a system whose output-input gain characteristic is y=2x+1. Determine the pdf of the output random variable Y.

5) Explain the following terms in detail.
   a) DPSK
   b) Orthogonal function .
   c) Raised-cosine filter.
   d) Eye pattern.