Signals & Systems
(EC-206, Dec-2005)

Note: Section A is compulsory. Attempt any four questions from Section-B and any two from Section-C.

Section-A

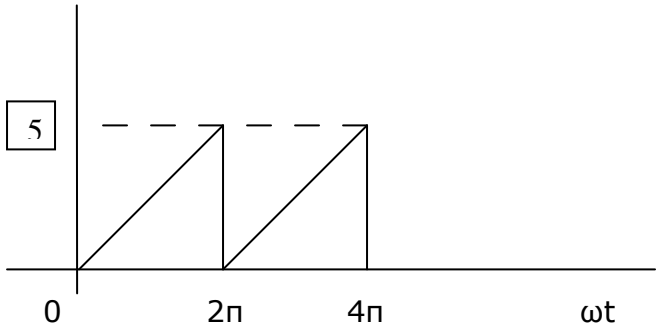
1. a) Differentiate between complex and trigonometric fourier series.
   b) What do you mean by power spectral density?
   c) What is the significance of step and time domain response analysis?
   d) What do you mean by true averages?
   e) Define sampling theorem.
   f) Write any two properties of marched filter.
   g) What is Gaussian noise?
   h) What do you mean by Avalanche noise?
   i) Write short note on noise equivalent bandwidth.
   j) Find Fourier transfer of unit step junction.

Section-B

2. Which of the following are energy & power signals
   (a) $x(t) = 8\, e^{j\omega t}\, u(t)$
   (b) $x(t) = Ay(t)$
   Verify your answer.
3. Explain the concept of noise figure.
4. Find the continuous term Fourier transform of $x(t) = u(t) \sin wt$
5. Find constant C so that
   $f(x) = \begin{cases} C(x-1) & 1 < x < 4 \\ 0 & otherwise \end{cases}$
   Also find $P(2<X<3)$
6. Explain the concept of transformation of random variables.

Section-C

7. Derive a relation for the noise figure of cascade of two stages of amplifiers.
8. (a) Noise figure of the two individual stages of amplifier is 2.03 and 1.54 respectively. The available power gain of first stage is 62. Evaluate overall noise figure.
   (b) Derive relationship between marginal and conditional probabilities.
9. (a) Find the exponential Fourier series for signal shown below:



   (b) Explain the graphical interpretation of convolution.