Code :EE05343

RA

III B.Tech II Semester(R05) Supplementary Examinations, April/May 2011
LINEAR & DISCRETE SYSTEMS ANALYSIS
(Electrical & Electronics Engineering)
(For students of RR regulation readmitted to III B.Tech II Semester R05)

Time: 3 hours **Max Marks: 80**

Answer any FIVE questions
All questions carry equal marks

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1. (a) Define the following:
   i. State variables
   ii. State vector.
   (b) State the properties of state transition matrix
   (c) Obtain the state equation of the system for the network as shown in figure 1.

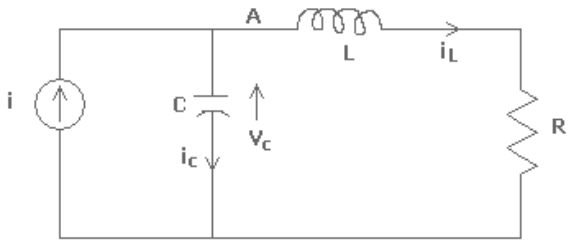

Figure 1:

2. (a) Discuss the effective value of a periodic non-sinusoidal waveform.
   (b) Determine the Fourier series of voltage response obtained at the output of a half wave rectifier shown in figure 2.

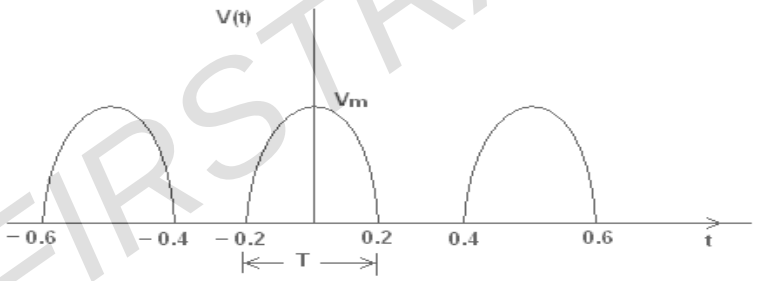

Figure 2:

3. (a) Verify the parsevals theorem for the signal $g(t) = e^{-\alpha t}u(t)$
   (b) If $g(t) \Leftrightarrow G(\omega)$ show that $g^*(t) \Leftrightarrow G^*(-\omega)$.
4. (a) Find the convolution for the signals.
   i. $x(t) = \begin{cases} 1 & 0 < t < T \\ 0 & otherwise \end{cases}$
   ii. $h(t) = \begin{cases} t & 0 < t < 2T \\ 0 & otherwise \end{cases}$
   (b) Given LT, how do you obtain its F.T.
5. Given $z(s) = \frac{(s^2+Xs)}{s^2+5s+4}$
   (a) What are the conditions on 'X' for Z(s) to be a positive real function?
   (b) Find 'X' for Re (Z (jw)) to have a second order zero at w=0.
6. (a) What is the effect of partial removal of a pole from driving point function? Explain with example.
   (b) Find Foster I form of LC network for the impedance $F(s) = \frac{s(s^2+2)}{(s^2+1)(s^2+3)}$.
7. Deduce the expression of Rayleigh's theorem for energy and power signals.
8. Show that if x(n) is a right-sided sequence and X(z) convergence for some value of z, then the ROC of X(z) is of the form $|z| > r_{\max}$ or $\infty > |z| > r_{\max}$ where $r_{\max}$ is the maximum magnitude of any of the poles of X(z).

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