Code :R7310206

R7

III B.Tech I Semester(R07) Supplementary Examinations, May 2011
LINEAR SYSTEMS ANALYSIS
(Electrical & Electronics Engineering)

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

Answer any FIVE questions
All questions carry equal marks
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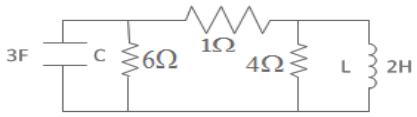
1. (a) What are the state variables chosen in Analysis of electrical circuits?
   (b) Write state variable equation for the following differential equation:
   $\ddot{y} + 5\dot{y} + 6y = \sin t + 5\dot{e}^{-t}$
   (c) Find state equation for the network shown in fig.



2. (a) Find the RMS & average values of the periodic function shown in Figure:1.

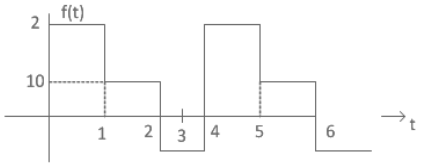


Figure 1: Figure for Question No.2(a)

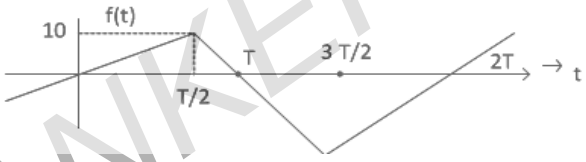
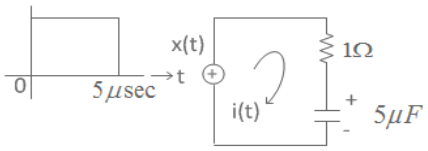


Figure 2: Figure for Question No.2(b)

   (b) Find the exponential Fourier series for the waveform shown in Figure:2
3. (a) Show that it is possible to concert an exponential Fourier series into trigonometric one.
   (b) Find evens and odd components of the function e^{-at} cu(t).
4. (a) State the convolution Theorem and determine the Laplace transform of the given function by using convolution theorem $G(s) = \frac{s}{(s+1)(s+5)}$.
   (b) A voltage pulse of 10V magnitude and 5μsec duration is applied to the Rc n/w shown in fig using l-T method.



5. (a) State the properties of Huercuitz polynomial.
   (b) Determine the range of constant K for the polynomial p(s)= $s^4+ks^3+s^2+2s+1$ to be Huruitz through polynomial.
6. Realize the driving point impedance $Z(s) = \frac{(s+2)(s+5)}{(s+1)(s+3)}$ in Fouler Fist Form and Cauer's First Form.
7. Explain the following with suitable examples:
   (a) Impulse Sampling.
   (b) Natural and falte top sampling.
   (c) Band pass sampling.
   (d) Power density spectrum.
8. (a) What are the difference between continuous and discrete time signal.
   (b) Obtain the inverse z - transform of the following:
      i. $X(z) = \frac{10}{(z-1)(z-2)}$
      ii. $\frac{1+z^{-1}-z^{-2}}{1-z^{-1}}$
      iii. $\frac{z-4}{(z-1)(z-2)^2}$

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