ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : MAY / JUNE 2010

REGULATIONS : 2007

FOURTH SEMESTER : EEE

070280025 - NETWORK ANALYSIS AND SYNTHESIS

TIME : 3 Hours **Max.Marks : 100**

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1. What are the advantages of using Laplace transforms?
2. State the final value theorem.
3. A DC voltage is applied to a series RL circuit by closing a switch. The voltage across L is 100V at t=0 and drops to 13.5V at t=0.02s. If L=0.1H, find R.
4. A series RC circuit consists of resistor of 8 Ω and capacitor of 0.33uF is excited by a constant voltage of 30 V is applied to the circuit at t=0. Obtain the current equation.
5. What are shifted functions?
6. Give the significance of poles and zeros
7. List any three necessary conditions for Transfer functions
8. Define pole zero plot.
9. Define active and passive ports
10. Give the driving point impedence at port 1 with port 2 open
11. Express ABCD parameters in terms of Y-parameters.
12. When is the network N' a dual of network N?
13. Define a neper
14. Give the formula for characteristic impedence of symmetrical T-Section

15. Give the plot for characteristic impedence with respect to frequency in case of constant K high pass filter
16. Define attenuation constant and phase constant
17. Give any 2 conditions for a polynomial to be Hutwitz
18. List the properties that function should satisfy to be a positive real function
19. How Foster from II is realized
20. List any four properties of RC driving point impedance function.

PART – B

(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

21. For the circuit shown in fig1, Determine the current in the 10 Ω resistor when the switch is closed at t=0. The initial current in the circuit is zero but the initial current through the inductor is 0.1A.

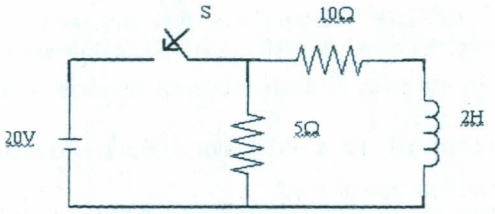

Fig 1.

22. The Transfer function of a system is $G(s)=(s+3)/[s(s^2+2)]$, determine the unit step and ramp function response.

23. Express z-parameters in terms of ABCD parameters and h-parameters.

24. Determine the Z-parameter for the circuit shown in Fig 2.

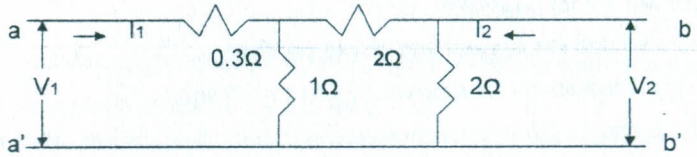

Fig 2.

25. Design a constant k low pass T section filter having a cut-off frequency of 3kHz and nominal characteristics impedance of R_o=600 Ohm

26. Prove that for a m-derived band pass filter $m = \sqrt{1-\left(\frac{f_2 - f_1}{f_{\infty 2} - f_{\infty 1}}\right)^2}$

27. Synthesize the LC driving point impedance function Z (s) = (s+1)/($2S^2$+2S+1) to get Cauer first and second forms and draw the network

28. Design a symmetrical lattice attenuator to have a characteristic impedance of 600 Ω and attenuation of 40dB

******THE END*******