Dr. Mahalingam College of Engineering and Technology, Pollachi-3

(An Autonomous Institution)

CCET I (2016_Regulation)

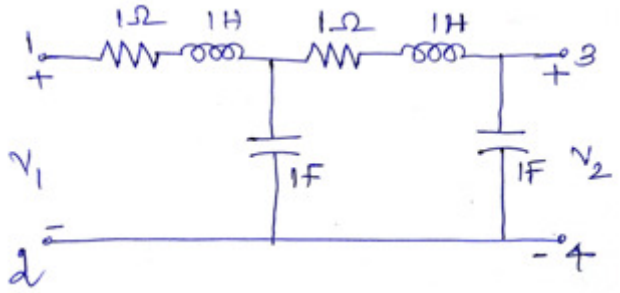
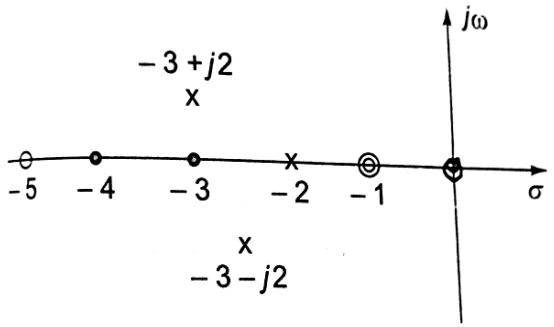
16EET44 Networks and Signals

Answer Key

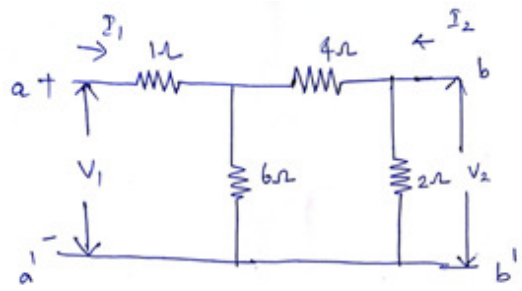
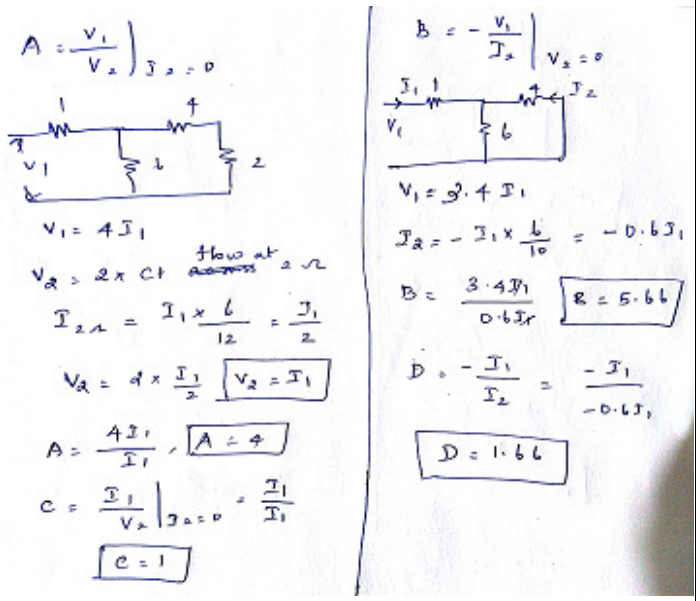
Sem:IV Date& Session: **31.01.18(FN1)** Duration: 1½ hours Max. Marks: 50

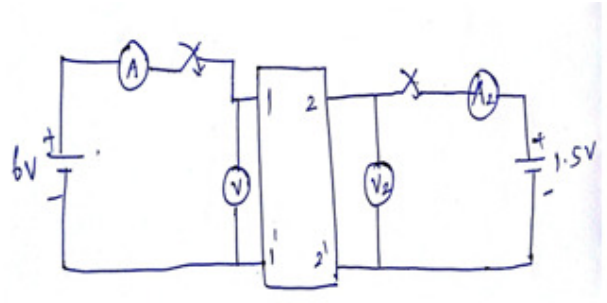
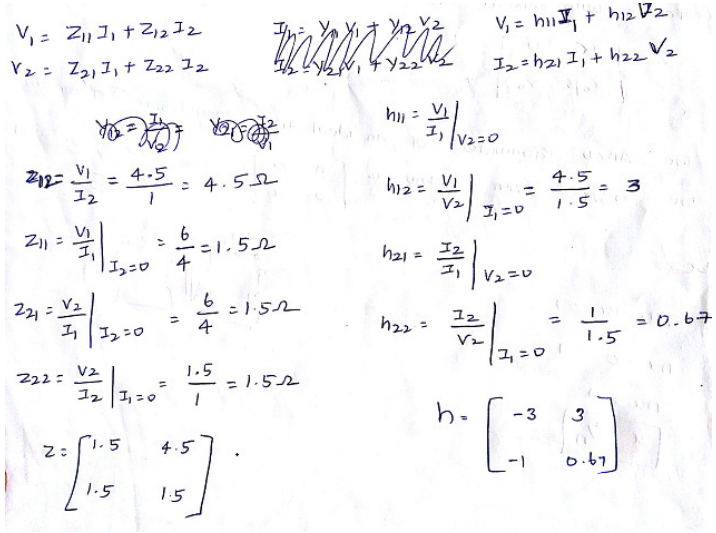
Part- A Objective Questions (10X1=10 Marks)

Q. No	Question	CO No	Blooms Level
1	The impedance matrices of two, two port networks are given by $\begin{bmatrix}3 & 2\\2 & 3\end{bmatrix}$ and $\begin{bmatrix}15 & 5\\5 & 25\end{bmatrix}$. If the two networks are connected in series. What is the impedance matrix of the combination. a) $\begin{bmatrix}3 & 5\\2 & 25\end{bmatrix}$ **b)** $\begin{bmatrix}18 & 7\\7 & 28\end{bmatrix}$ c) $\begin{bmatrix}3 & 8\\2 & 35\end{bmatrix}$ d) $\begin{bmatrix}15 & 2\\5 & 3\end{bmatrix}$	CO1	**U**
2	The ABCD parameters of an ideal n:1 transformer is $\begin{bmatrix}n & 0\\0 & x\end{bmatrix}$. The value of x will be a)x=n b)x=0 c)x=1 **d)x=1/n**	CO1	**AP**
3	Which parameters are widely used in transmission line theory a)Z parameters b) Y parameters **c)ABCD parameters** d)h parameters	CO1	**U**
4	For a two-port network to be reciprocal. a)$Z_{11}=Z_{22}$ b)$h_{21}=-h_{12}$ **c)$Y2_1=Y_{22}$** d)AD-BC=0	CO1	**U**
5	For a lattice network the value of the series impedance is 3Ω and that of the diagonal impedance is 5 Ω, then Z parameters of the network are given by a) $Z_{11}=Z_{22}=$ 2 Ω, $Z_{12}=Z_{21}=$ 1/2 Ω, **b) $Z_{11}=Z_{22}=$ 4 Ω, $Z_{12}=Z_{21}=$ 1 Ω,** c) $Z_{11}=Z_{22}=$ 8 Ω, $Z_{12}=Z_{21}=$ 2 Ω, d) $Z_{11}=Z_{22}=$ 5 Ω, $Z_{12}=Z_{21}=$ 2Ω,	CO1	**U**
6	The expression of A in transmission parameter interms of Z parameter **$A=Z_{11}/Z_{21}$**	CO1	**U**
7	In the first Foster form the presence of last element inductor L∝ indicates (a) pole at ω=0 **(b) pole at ω = ∝** (c) zero at ω= ∝ (d) zero at ω= 0	CO1	**U**
8	An LC impedance or admittance function _____ **(a) has simple poles and zeros in the left half of the s-plane.** (b) has no zero or pole at the origin or infinity. (c) is an odd rational function. (d) has all poles on the negative real axis of the s-plane	CO2	**U**
9	Poles and Zeros are called critical frequencies. **True**	CO2	**U**
10	Pole at infinity indicates that the **a)degree of numerator is greater than that of denominator** b) degree of denominator is greater than that of numerator c) degree of denominator is equal to degree of numerator	CO2	**U**

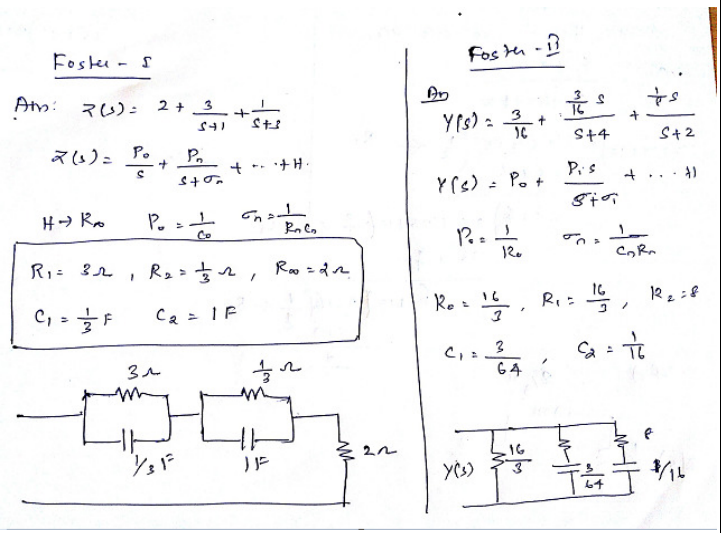
Part- B	Short Answer Questions	(5X2=10 Marks)	
Q. No	Question	CO No	Bloo ms Level
11	**(i) Driving point impedance** The ratio of transform voltage at one port to the transform current at the same port. $Z_{11}(s)=V_1(s)/I_1(S)$ **(ii)Transfer impedance** The ratio of transform voltage at one port to the transform current at the other port. $G_{21}(s)=V_2(s)/I_1(S)$	CO1	**U**
12	For the ladder two-port network shown find the open circuit driving point impedance at port 1-2  Ans: $Z11=\frac{s^4+2s^3+3s^2+3s+2}{s^3+s^2+s+1}$	CO1	**U**
13	Draw the pole zero plot for a given network function. $Z(S)=\frac{3s(s+1)^2(s+5)}{(s+1)(s+3+j2)(s+3-j2)}$	CO1	**U**
	 		
14	List out the properties of RL impedance function • Poles and zeros are located on the negative real axis of s-plane • Poles and Zeros are interlaced • S=0 at zero & S= ∝ at pole • The residues at the poles are real and negative	CO2	**U**
15	suitable network for the following impedance function. (i) $Z(S)=\frac{(s+1)(s+4)(s+3)}{s(s+2)(s+6)}$ **Ans: RC network** $(ii)Z(S)=\frac{s(s^2+4)}{(s^2+1)(s^2+25)}$ **Ans: LC network**	CO2	**U**

Part- C Descriptive – either or questions (2X15=30 Marks)

Q. No	Question	CO No	Bloo ms Level
16. (a)	Find the transmission or general circuit parameters of the given network  	CO1	

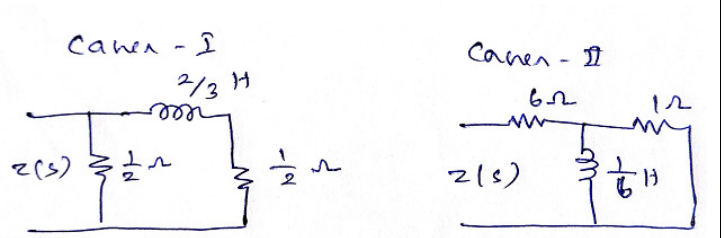
	OR		
16. (b)	(i)S_1-- open S_2--closed A_1=0A V_1=4.5V V_2=1.5V A_2=1A (ii)S_1--open S_2--open A_1=4A V_1=6V V_2=6V A_2=0A  	CO1	**Ap**
17. (a)	Analyse in Foster I and Foster II forms of realization of	CO2	**An**

following driving point function $Z(S) = \frac{2s^2+12s+16}{s^2+4s+3}$



OR

17. (b) Ans:



CO2 **An**