University Institute of Engineering & Technology

Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

Roll No.-.....

THEORY EXAMINATION – DECEMBER 2016 **TIME- 3 HRS**

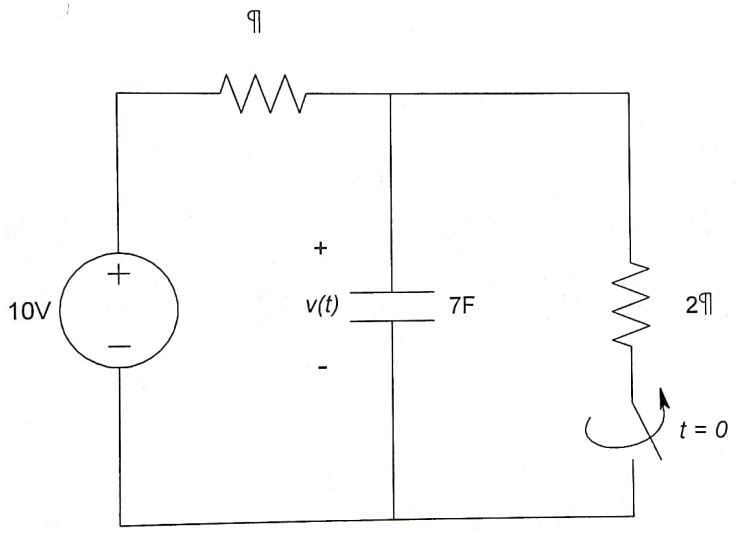
B. Tech (Electronics & Communication Engineering) 3rd Semester **M.M. -75**

COURSE NO.: ECE-205

COURSE TITLE: Network Analysis & Synthesis

PART-A (15 Marks)

Q.No.-1. Answer the following questions carrying one mark each. **15**

(i).	What is cutset matrix?
(ii).	Define singularity functions.
(iii).	In the circuit of Fig.1., the capacitor voltage just before t = 0 is_____:  Fig.1.
(iv).	Define the transient response of a circuit.
(v).	Define poles and zeros of a function.
(vi).	Explain the difference between driving point function and transfer function.
(vii).	List four different parameters of two port networks.
(viii).	Write the condition of reciprocity of a network in terms of h-parameters.
(ix).	Show [Z] parameters in terms of [Y] parameters.
(x).	What are the specifications of Low Pass and High Pass Filters?
(xi).	A constant k high pass p section has a characteristic impedance of 300 Ω at f = ∞. At f = fc, the characteristic impedance will be_____.
(xii).	An m derived low pass filter has fc = 1000 Hz and m = 0.6. This filter will have infinite attenuation at f_∞=_____Hz.
(xiii).	Discuss the demerits of m-derived Filters?
(xiv).	Define positive real functions.

(xv).	Differentiate Foster Form and Cauer Form.	

PART B (20 Marks)

Answer the following questions, one from each unit & all question carry equal marks. 5x4=2

	UNIT-I	
2	For the tree shown in Fig.2, develop the fundamental cut-set matrix.	5

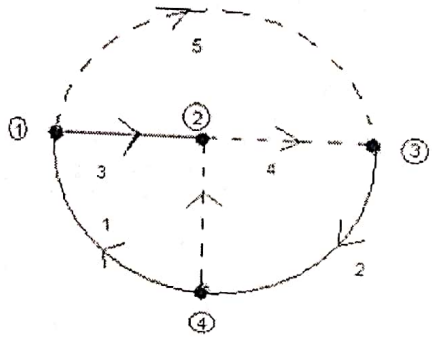


Fig.2.

	UNIT-II	
3	Discuss various restrictions on pole and zero locations for driving point function	5
	UNIT-III	
4	Determine the [Y] parameters of a two-port network whose Z parameters are $[Z] = \begin{bmatrix} 10 & 4 \\ 4 & 10 \end{bmatrix} \Omega$	5
	UNIT-IV	
5	Define and explain positive real functions with its various properties.	5

PART-C (40 Marks)

Students are required to attempt four question, by selecting at least one question from each unit & all question carrying equal marks. 10x4=40

	UNIT-I	
6	Derive and explain the Step Response of series RLC circuit.	10
7	For the circuit shown in Fig.3, find i(t) for t>0.	10

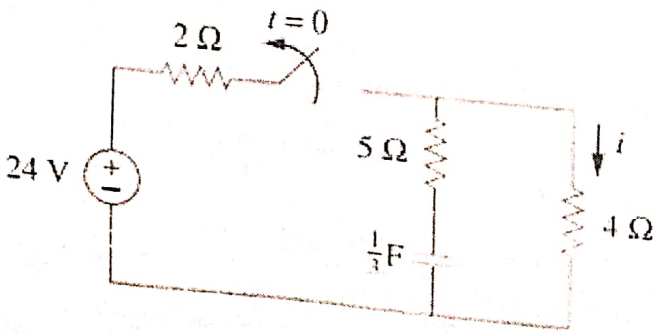


Fig.3.

UNIT-II

8	For the circuit shown in Fig.4, the switch is opened at t=0. Find the node voltages $v_1(t)$ & $v_2(t)$. L= 0.5h C= 1f G=1 mho V= 1v.	10

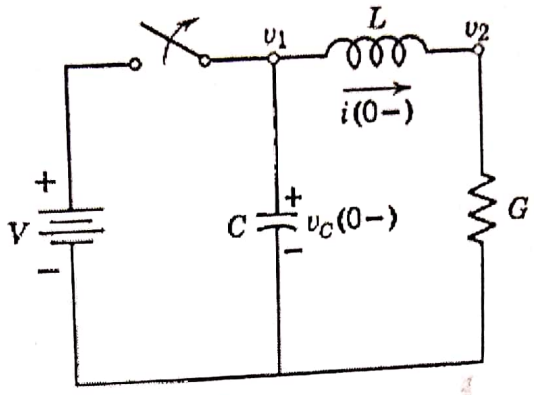


Fig.4.

9	Describe various restrictions on pole and zero locations for transfer functions.	10

UNIT-III

10	Determine the Z parameters for the two-port shown in Fig. 5.	10

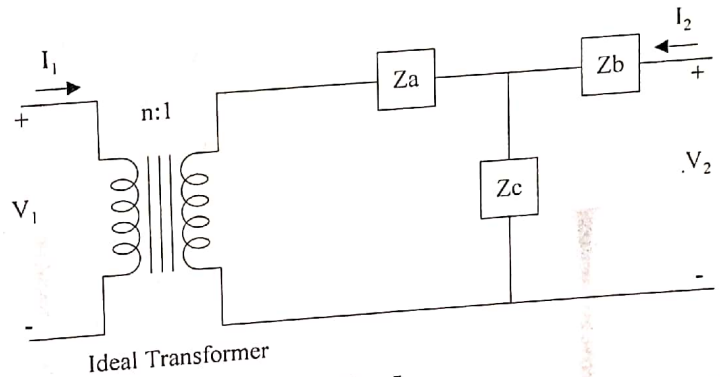


Fig.5.

11	Determine the ABCD parameters for the two-port shown in Fig. 6.	10

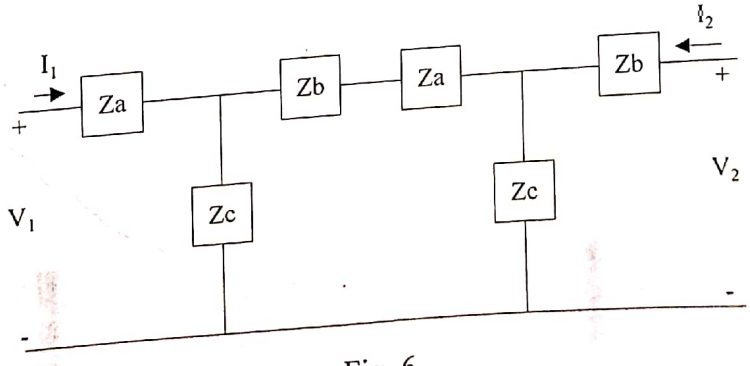


Fig. 6.

UNIT-IV

12	Design m-derived T-sections HPFs for R_0= 600 ohms, f_c= 1800 Hz and f_∞ = 2000Hz.	10
13	An impedance is given by $Z(s) = \frac{3s^2 + 18s + 24}{s^2 + 3s}$. Realize the network in Cauer-I form.	10