Q.P. Code: 18EE0242 **R18**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech II Year I Semester Regular Examinations Nov/Dec 2019

NETWORK THEORY

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

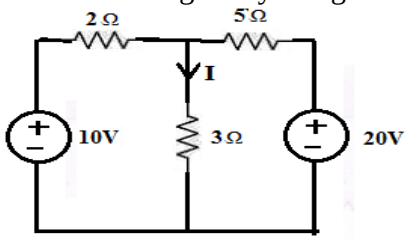
1	**a**	Define Super node and Super mesh.	**2M**
	b	Define Quality-factor and Selectivity.	**2M**
	c	What is the behavior of Capacitor in Initial and Steady state conditions?	**2M**
	d	What is the condition for Reciprocity in Z and Y parameters?	**2M**
	e	Write the expression for trigonometric form of Fourier series.	**2M**

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

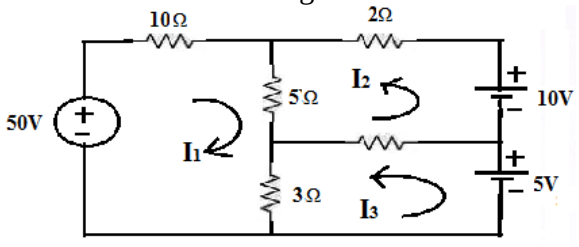
UNIT-I

2	**a**	State and prove Maximum power transfer theorem.	**5M**
	b	Calculate the current 'I' shown in below figure by using Millman's theorem.	**5M**



OR

3	**a**	Explain about Nodal analysis and write the steps for applying nodal analysis.	**5M**
	b	Determine the mesh currents for the following network.	**5M**



UNIT-II

4	**a**	A series RLC circuit has R=10Ω, L=0.1H and C=50μF. The applied voltage is 100V. Find Resonant frequency & Quality factor of a coil.	**5M**
	b	Explain about Series resonance with phasor diagrams.	**5M**

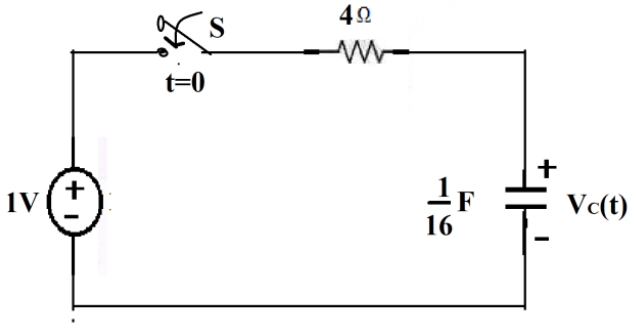
OR

5	**a**	Explain about Propagation constant and Characteristic impedance in Π-network filters.	**5M**
	b	Design Low Pass Filter in both T& Π section having a cut off frequency of 2KHz to operate with a terminated load resistance of 500 Ω.	**5M**

UNIT-III

6 **a** Derive the Transient Response of series RL-circuit with D.C excitation. **5M**

b Using classical method of solution of differential equations, find the value of $V_c(t)$ for $t>0$ in the circuit shown in figure. Assume $V_c(0^-) = 9v$. **5M**



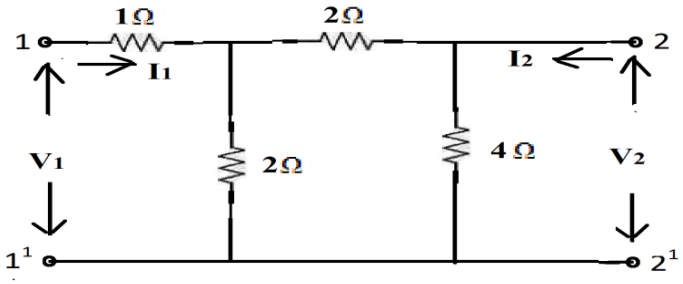
OR

7 Derive the Transient Response of Series RL circuit with Sinusoidal excitation. **10M**

UNIT-IV

8 **a** Explain about short-circuit parameters. **6M**

b Find the h-parameters of the network shown in figure **4M**



OR

9 **a** Derive the expressions for Chain parameters in terms of Z-parameters. **5M**

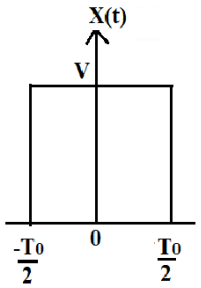
b The Z-parameters of a two-port network are $Z_{11}= 10\Omega$, $Z_{22}= 15\Omega$ $Z_{12}= 5\Omega$ and $Z_{21}= 5\Omega$. Find the equivalent T-network and ABCD parameters. **5M**

UNIT-V

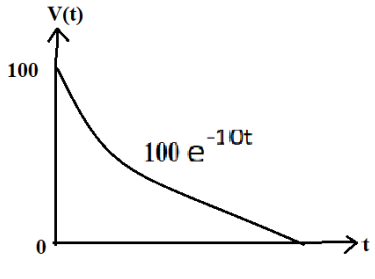
10 Write and prove the properties of Fourier transforms. **10M**

OR

11 Determine the Fourier transforms of the following waveforms shown in Figure (a) and Figure (b). **10M**



fig(a)



fig(b)

END