

Reg. No:

--	--	--	--	--	--	--	--	--	--

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech II Year I Semester Supplementary Examinations December-2021

NETWORK THEORY

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

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

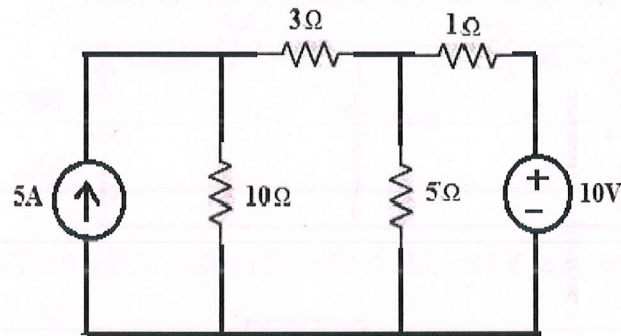
- | | | | |
|---|---|----|----|
| 1 | a Write the procedure to obtain Dual network. | L1 | 2M |
| | b Define Resonance and Resonant frequency. | L1 | 2M |
| | c What is the behavior of Capacitor in Initial and Steady state conditions? | L2 | 2M |
| | d Draw the equivalent circuit of Z-parameters. | L1 | 2M |
| | e Write the expression for trigonometric form of Fourier series. | L1 | 2M |

PART-B

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

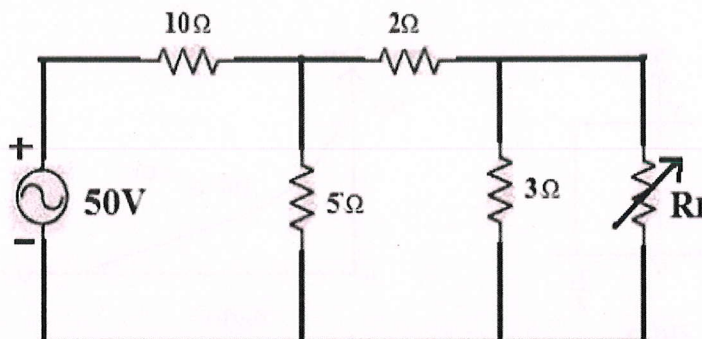
UNIT-I

- | | | | |
|---|---|----|----|
| 2 | a Explain about Mesh analysis and write the steps for writing mesh analysis. | L1 | 5M |
| | b Determine the current in 10Ω resistor for the following network by using nodal analysis. | L3 | 5M |



OR

- | | | | |
|---|---|----|----|
| 3 | a State and prove Reciprocity theorem. | L1 | 5M |
| | b Determine the maximum power delivered to the load in the circuit shown in below figure. | L3 | 5M |

**UNIT-II**

- | | | | |
|---|--|----|-----|
| 4 | Explain about Constant-K high-pass filter in detail. | L2 | 10M |
|---|--|----|-----|
- OR
- | | | | |
|---|---|----|----|
| 5 | a Explain about Quality factor and Band-width of Series resonance. | L2 | 5M |
| | b A series RLC circuit has $R=10\Omega$, $L=0.1H$ and $C=50\mu F$. The applied voltage is 100V. Find Resonant frequency & Quality factor of a coil. | L3 | 5M |

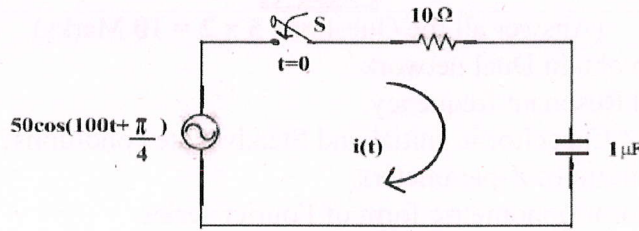
UNIT-III

6 Derive the Transient Response of Series RLC circuit with Sinusoidal excitation. **L1 10M**

OR

7 a A series RC circuit consists of a resistor of 10Ω and capacitor of 0.1 F with a constant voltage of 20v , is applied to the circuit at $t=0$. Obtain the current equation. Determine the voltage across the resistor and the capacitor. **L3 5M**

b In the circuit shown in figure, determine the complete solution for the current when switch is closed at $t=0$, applied voltage is $V(t) = 50 \cos(100t + \pi/4)$, resistance $R=10\Omega$ and capacitance $C=1\mu\text{F}$. **L3 5M**



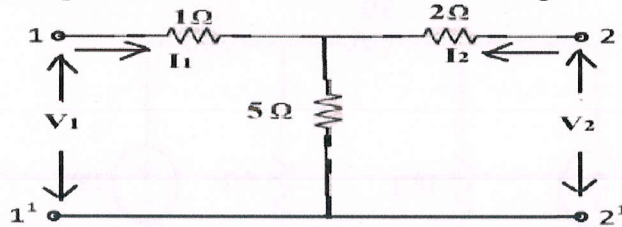
UNIT-IV

8 a Derive the expressions for Z-parameters in terms of ABCD-parameters. **L2 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? **L3 5M**

OR

9 a Find the transmission parameters for the circuit shown in figure. **L3 5M**



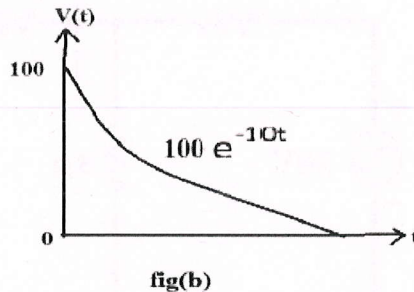
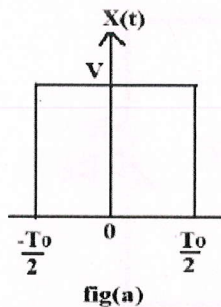
b The given Y-parameters are, $Y_{11} = 0.5$, $Y_{12} = Y_{21} = 0.6$, $Y_{22} = 0.9$. Find Impedance parameters. **L3 5M**

UNIT-V

10 Write and prove the properties of Fourier transforms **L1 10M**

OR

11 Determine the Fourier transforms of the following waveforms shown in figure(a) and figure(b). **L3 10M**



END