

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)

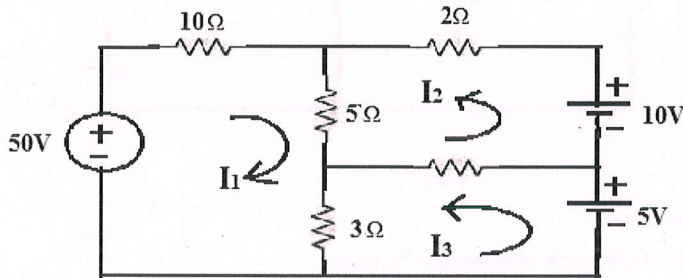
Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

**UNIT-I**

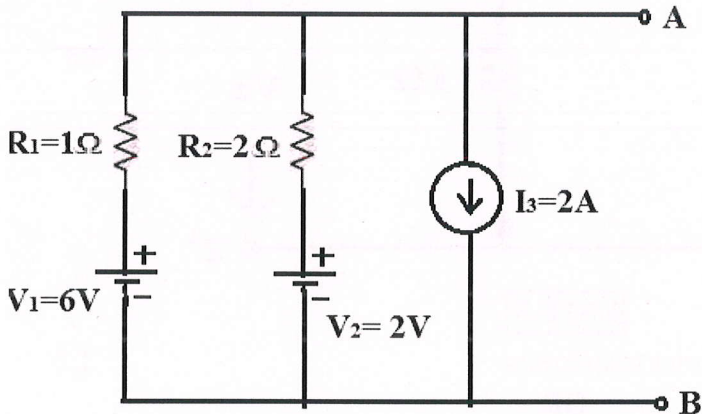
- 1 a Explain about Nodal analysis and write the steps for applying nodal analysis. **L2 6M**  
 b Determine the mesh currents for the following **L4 6M**



network.

**OR**

- 2 a State and prove Tellegen's theorem. **L2 6M**  
 b Determine the equivalent current source between the terminals A and B. **L4 6M**



**UNIT-II**

- 3 a 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. **L4 6M**  
 b Explain about Series resonance with phasor diagrams. **L2 6M**

**OR**

- 4 a Explain about Quality factor and Band-width of Series resonance. **L2 6M**  
 b Design constant-K band pass filter having a design impedance of  $500\Omega$  and cut-off frequencies  $f_1=1kHz$  and  $f_2=10kHz$ . **L4 6M**

**UNIT-III**

5 Derive the Transient Response of Series RLC circuit with Sinusoidal excitation. **L2 12M**

**OR**

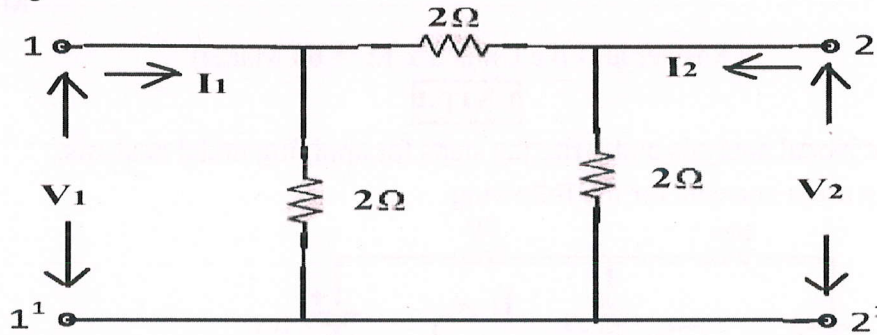
6 Derive the Transient Response of series RLC-circuit with D.C excitation **L2 12M**

**UNIT-IV**

7 a Explain about Impedance parameters. **L2 6M**

b Find the transmission parameters for the circuit shown in **L4 6M**

figure.

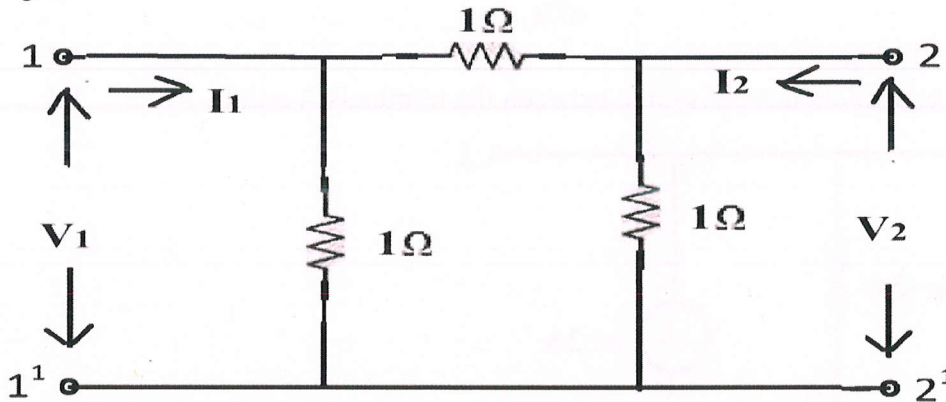


**OR**

8 a Explain about ABCD-parameters. **L2 6M**

b Find the Z-parameters of the network shown in below **L4 6M**

figure



**UNIT-V**

9 Write and prove the properties of Fourier transforms. **L2 12M**

**OR**

10 i) Define Fourier series. **L1 12M**

ii) Define Fourier transform.

iii) Write the expression for trigonometric form of Fourier series.

iv) Write the expression for exponential form of Fourier series.

v) Write any two properties of Fourier transforms

\*\*\* END \*\*\*