CODE No.: 16BT10241 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

I B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations December - 2018

NETWORK ANALYSIS

[Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

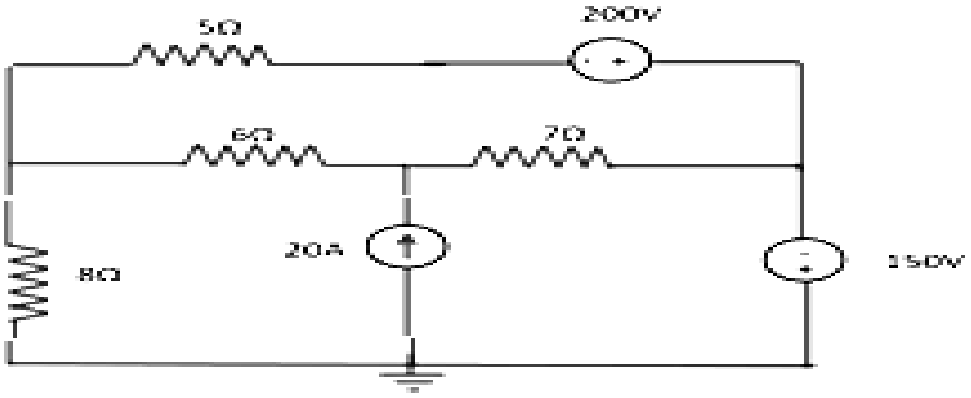
Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

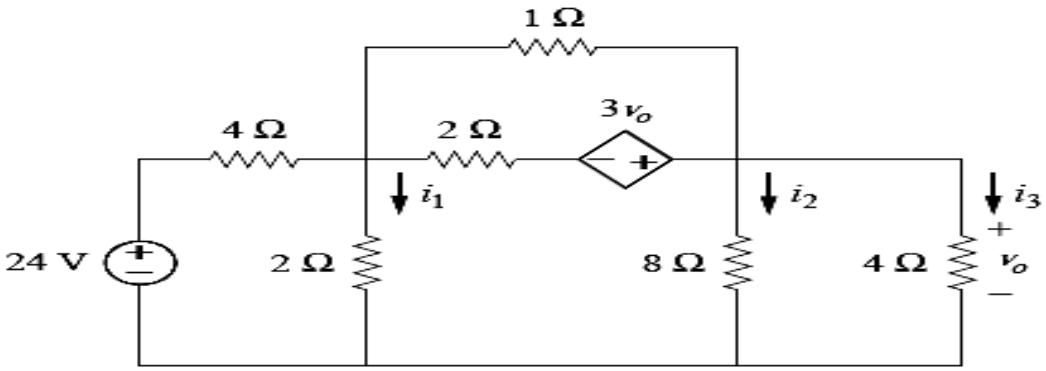
1 a) Explain the terms super mesh and super node and apply these concepts to electrical network. 7 Marks

b) Compute the voltage across the 7Ω resistor, using mesh analysis. 7 Marks



(OR)

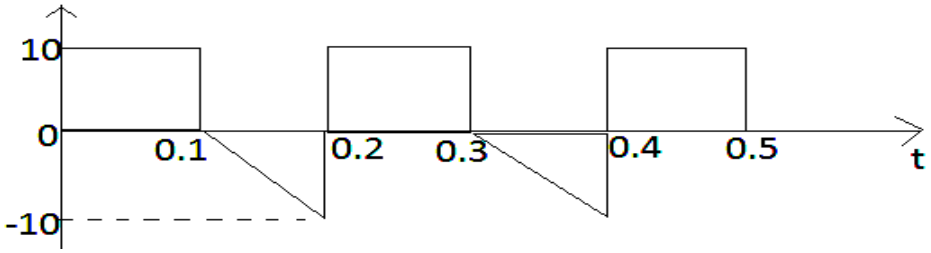
2 Determine the currents I_1 and I_2 in the circuit shown in figure using nodal analysis. 14 Marks



UNIT-II

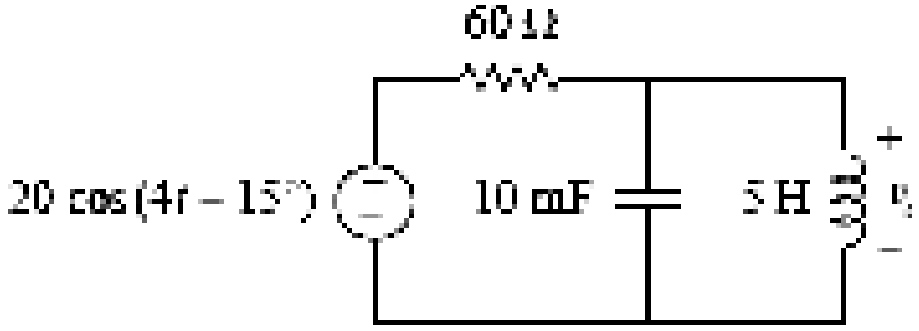
3 a) Compute active and reactive components of the current taken by a series circuit consisting of a coil of inductance 0.1H and resistance 8Ω and a capacitor of 120μF connected to a 230V, 50Hz supply mains. Find the value of the capacitor that has to be connected in parallel with the above series circuit so that the power factor of the entire circuit is unity. 7 Marks

b) Compute the effective value, average value, form factor and peak factor of the waveform shown below. 7 Marks

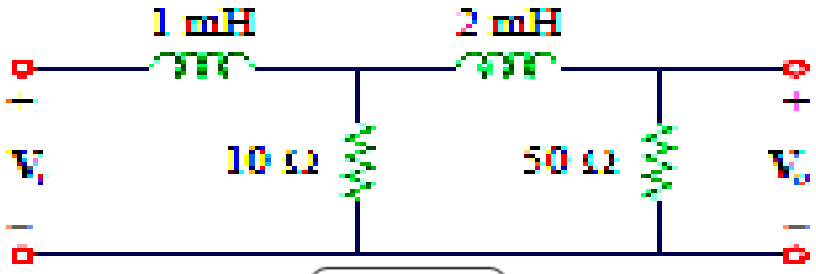


(OR)

4 a) Determine the $V_0(t)$ in the circuit shown in figure. 7 Marks

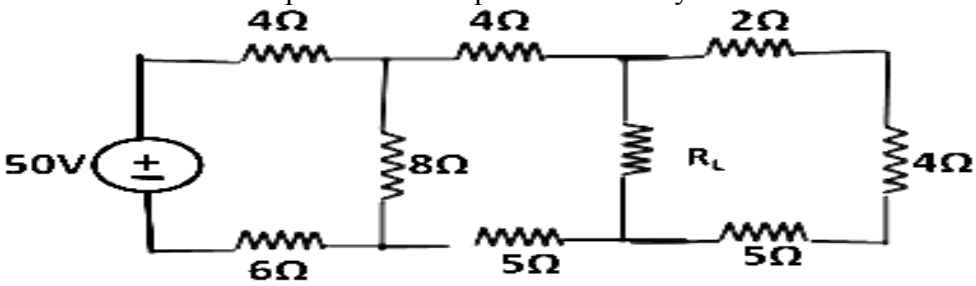


b) If 1V is applied at V_i, find the magnitude and the phase shift produced at 5kHz. Specify whether the phase shift is leading or lagging. 7 Marks

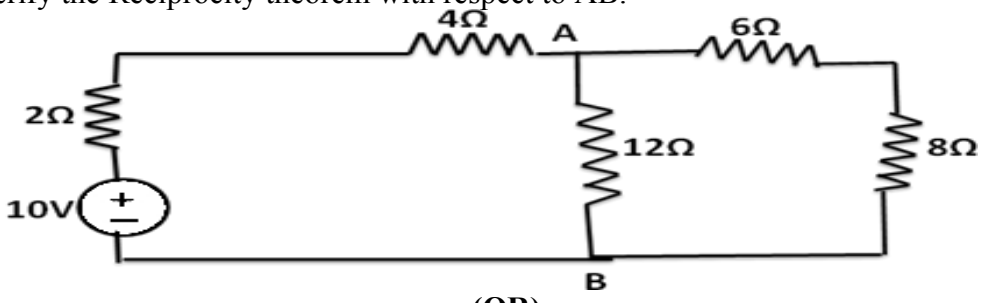


UNIT-III

5 a) Find the value of R_L for receiving maximum power from the source. Also determine the maximum power and the power efficiency. 7 Marks

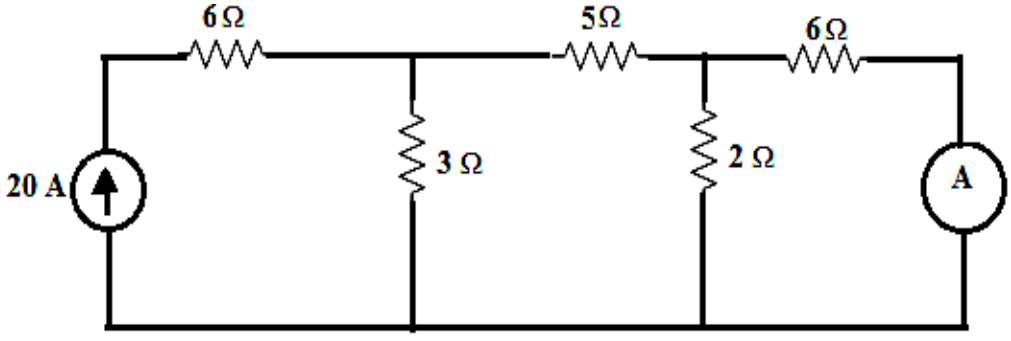


b) Verify the Reciprocity theorem with respect to AB. 7 Marks



(OR)

6 a) Using the compensation theorem, determine the ammeter reading where it is connected to 6Ω resistor as shown in figure. The internal resistance of ammeter is 2Ω. 8 Marks

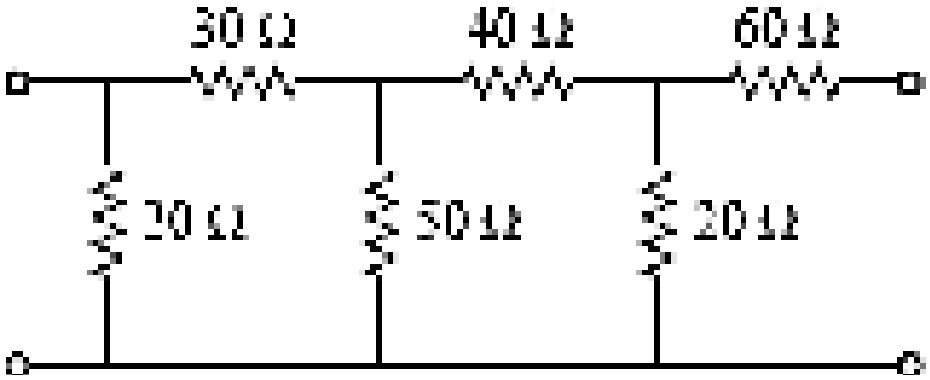


b) Explain the Tellegen's theorem with suitable example. 6 Marks

UNIT-IV

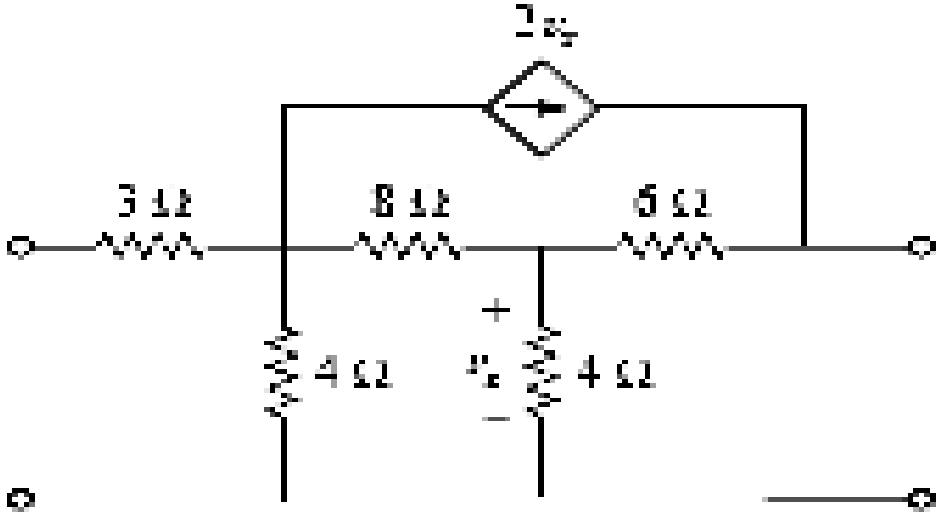
7 a) Determine the [Y] and [T] parameters of two port network, whose [Z] parameters are $[Z] = \begin{bmatrix} 6 & 4 \\ 4 & 6 \end{bmatrix}$. 7 Marks

b) Obtain the ABCD parameters for the circuit in the figure. 7 Marks



(OR)

8 a) Obtain the hybrid parameters of the two port network given below. 10 Marks



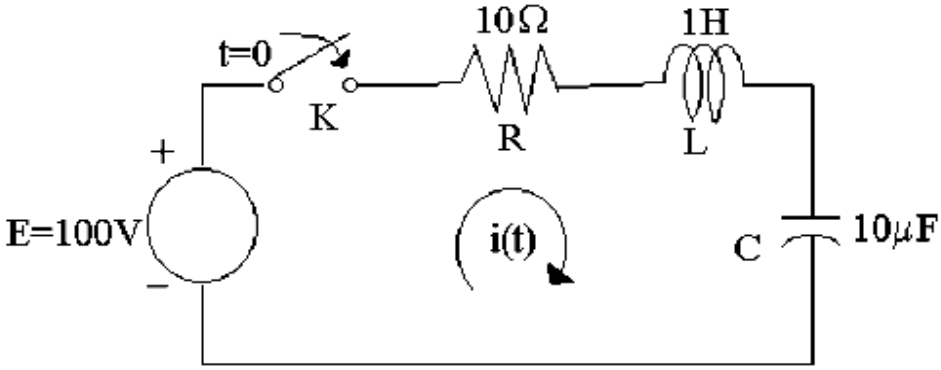
b) Convert the Hybrid parameters deduced in (a) into [Z] parameters. 4 Marks

UNIT-V

9 A series RC circuit with R = 50Ω and C = 2 micro farad has a sinusoidal voltage source **V = 150 *Sin(*500*t* φ+π/3)** volts applied at a time when **φ = 0**. Find the expression for the total current. Use Laplace transforms method 14 Marks

(OR)

10 a) For the circuit shown, the switch is closed at t = 0. If the current in L and voltage across C are zero for t<0, find $i(0^+)$, $\left.\frac{di(t)}{dt}\right|_{t=0+}$, $\left.\frac{d^2i(t)}{dt^2}\right|_{t=0+}$ and also compute the i(t) at t>0. 7 Marks



b) Compute the response $i_L(t)$ for $t > 0$ in the circuit shown below. Plot the response including time interval just prior to switching action. 7 Marks