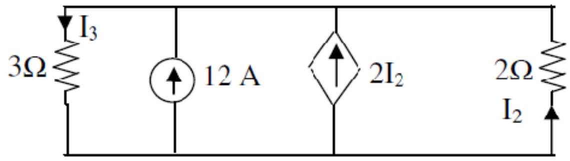
II.B.Tech–ECE

NETWORK ANALYSIS

QUESTION BANK

Unit-1

1. (a) Find the power delivered by each branch fr

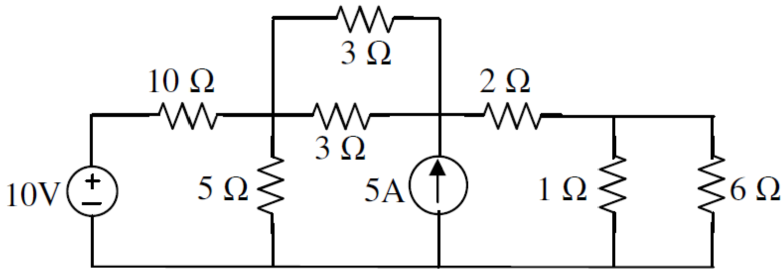


[3 m]

(b) Explain the source transformation with a [7]

2. (a) A resistor is connected across a capacitor of ... μF
which has been previously charged to a pote
If the potential difference falls to ... in 5 minutes, calculate ... 300 ...
resistance in the circuit [3]

(b) Determine the voltage at each node of the



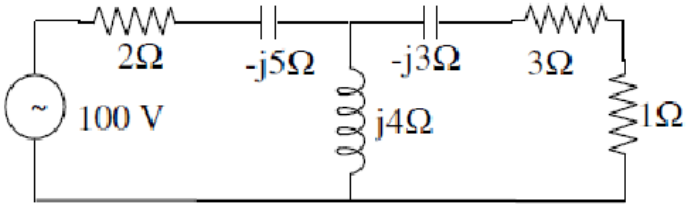
[7]

3. (a) Draw the graph corresponding to the follo

$$A=\begin{bmatrix} -1 & 0 & 0 & 0 & 1 & 0 & 1 & 0 \\ 0 & -1 & 0 & 0 & 0 & 0 & -1 & 1 \\ 0 & 0 & -1 & -1 & 0 & -1 & 0 & -1 \\ 0 & 0 & 0 & 0 & -1 & 1 & 0 & 0 \\ 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \end{bmatrix}$$ [3]

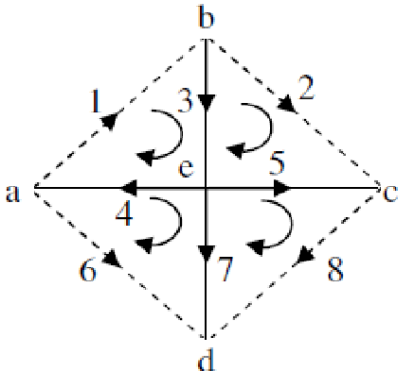
(b) Explain the rms value and average value o
Derive necessary expressions

4. (a) In the following network, determine the power (i) mes
currents
(i) power supplied by (ii) power dissipated in
resistor



[7]

(b) Write the fundamental circuit for the follow
graph



[3]

5. (a) A series circuit has two voltage and
circuit are $v = 100\sin(377t + 30^\circ)$ and $i = 10\sin(377t + 60^\circ)$

.Find elements in the circuit

(b)Determine formfactor and peakfactor of t

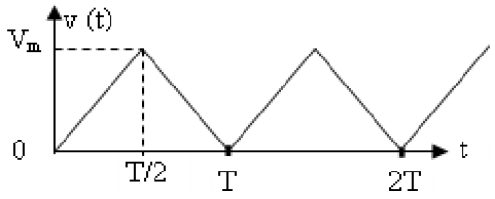


Figure 2

[7]

6. (a)Find the total power delivered in the cir
me thod

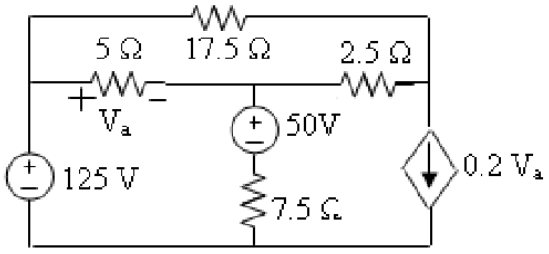
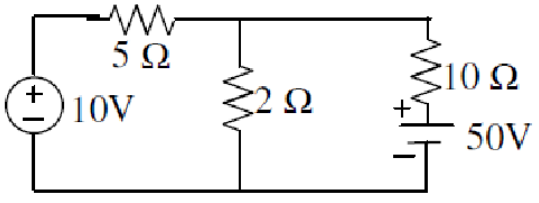


Figure 3

[7]

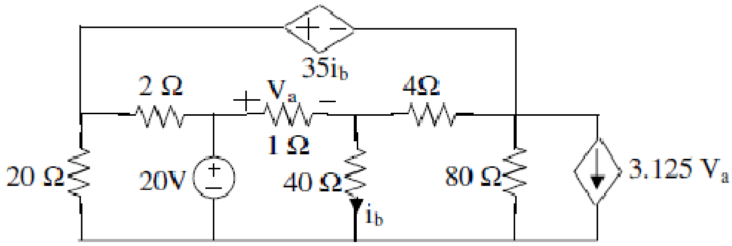
(b)Determine loop currents fromthe followi



[3]

7. (a)Define the following (i) instantaneous value
(i) rms value (ii) form factor

(b)Use node voltage method to find the power
source in the circuit fromthe following f



[6]

Unit-2

1. (a) A coil of resistance r and inductance l is c
 50 hz supply, The current through the coil is fo
 power
 Dissipated. Find r and l 100 .4 [4]

 (b) Show that the real power consumed by a p
 inductor
 is zero [8]

2. (a) A resistor r is connected in series with
 combination
 is connected across 50 hz supply, 100. The voltage drop acr
 the resistor is 60 v and power dissipated in . Find
 and. [4]

 (b) For an rc series circuit a sinusoidal voltage v(t) = vm sin ωt is
 applied at
 t = 0. Find the expression for transient current [8]

3. (a) A sinusoidal voltage v(t) = 20 sin 75t is applied sudden

RL circuit with R = 20 Ω and L = 0.4 h find the instant at which current becomes zero [8]

(b) The resistor r in series with capacitance c, ... 240 v supply. Find the value of c so that r absorbs ... vol. Find also the maximum charge [4]

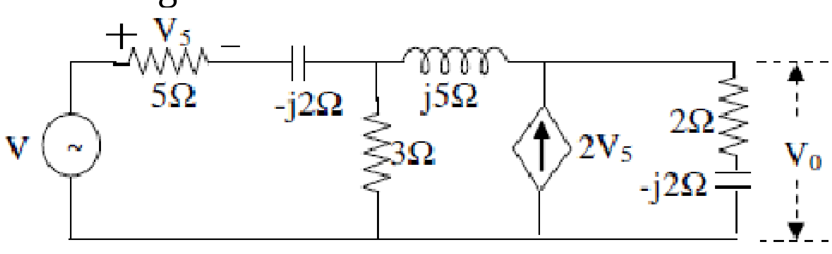
4. (a) A series r-l-c circuit consists of 100 _ resistor ... 0.318 h and A capacitor of unknown value. This circuit is supplied by ..., 50 hz supply and draws a current of 2 ... and the current is in phase with the supply. find (i) voltage value of the capacitor (ii) the power supplied by the source [8]

(b) A series rlc circuit has the following parameters: r = 10 ohms, l = 0.3 h, c = 120 µf. calculate the res. ... Under resonant condition, calculate current, power and voltage drops across various ..., if the applied voltage is 100 v [4]

5. (a) An r-l series circuit has r = 5 ohms and l = 0.1 H. Find the power factor of the circuit if an alternating ... is applied across the circuit [8]

(b) A coil with a resistance of 7 _ and an inductance of ... 0.3 ... is connected to 50 hz, 230 v supply. (i) the circuit current (ii) phase angle (iii) power factor (iv) power consumed [8]

6. Find value of voltage V_g = 140 v ... in the circuit shown in figure



[8]

Unit-3

1. (a) Give a comparison between series and par... [8]
(b) A series RLC circuit consists ... Ω, inductance ... Ω ...

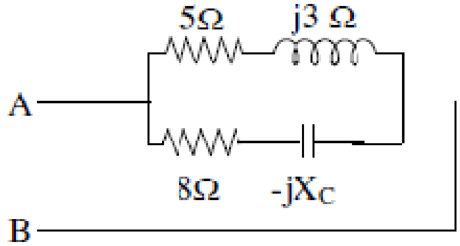
0.4 h, capacitance of 250 μf is connected across, 50 hz supply of 2
Find the total impedance, current, power, power factor, voltage across coil and capacitance [8]

2. (a) Show that the resonant frequency is the g
half power frequencies [8]
(b) Define self, mutual inductance and coefficient of coupling in a coupled Circuit [8]

3. (a) Derive the expressions for quality fac
series rlc resonant circuit [8]
(b) Define quality factor. What is bandwidth? What is the importance of these parameters in series resonant circ [4]

4. (a) Two coupled coils have self-inductances l1 = .2 and l2 … The coefficient of coupling between them is 0.5. If (10 sin 400t) ... a 01
$i = t -$ flows through coil 1 and $i_2 = 20 \sin(400t - 30)$ flows through coil 2, find the voltages across the coils, if mutually induced e.m.f opposes the self induced e.m.f. [8]
(b) An electrical circuit with R = 10 Ω, L = 0.1 H and C = 100 μf are all connected in parallel. The circuit is energized with 50 hz. Calculate (i) the impedance (ii) current taken from the
(iii) power factor of the circuit and [4]

5. (a) What are the characteristics of parallel resonance? [3]
(b) For the circuit shown in figure, find the value of X for which the Circuit is under resonance.

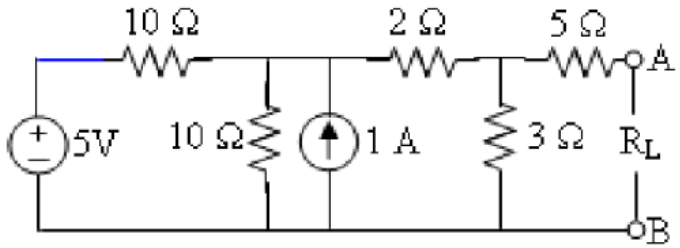


[8]

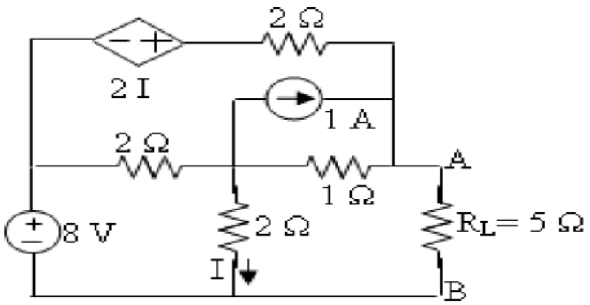
Unit-4

1. (a) State thevenin's theorem and maximum power theorem [3]

(b) Find the resistance to be connected between the terminals A and B so that maximum power is drawn from the circuit shown in the following figure. Also find the maximum power. [8]



2. (a) Determine the current through the load resistance in the following figure and also find maximum transferred power. [8]



(b) State Millman's theorem and write its limitations. [8]

3. (a) State maximum power transfer theorem and write its limitations. [8]

(b) Find the Nortons equivalent circuit

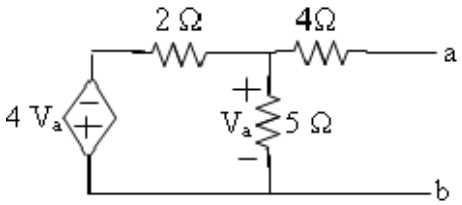
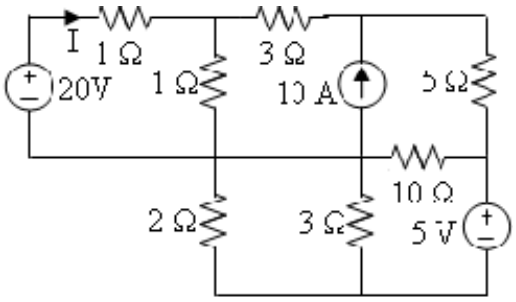


Figure 4 [8]

4. (a) State reciprocity AND compensation THE

(b) Determine current i using superposition



[8]

5. (a) Verify Tellegen's theorem

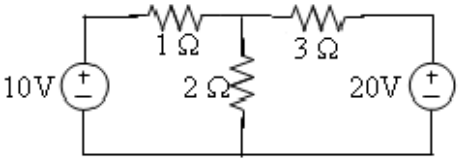
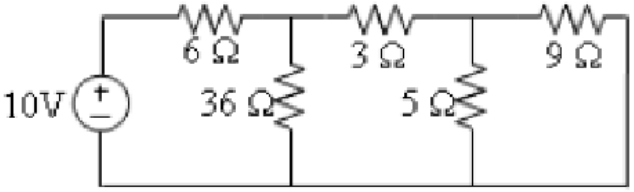


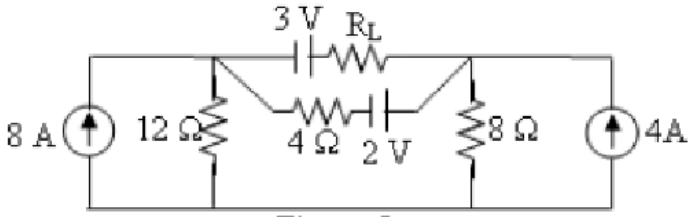
Figure 4 [5]

(b) Find current in 9 Ω resistor in the circuit from th
when 5 Ω resistor is changed to compensation the



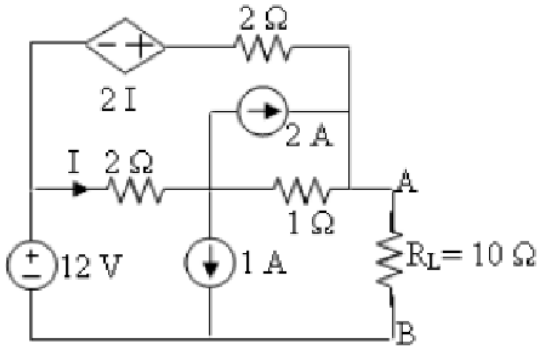
[5]

6. Obtain the maximum amount of power transfer from the sources using maximum power transfer theorem in the following circuit



[8]

7. Determine the current through R_L in the following circuit using thevenins theorem and verify by Norton theorem. Find the value of R_L for which maximum power will be transferred and find the maximum power transfer

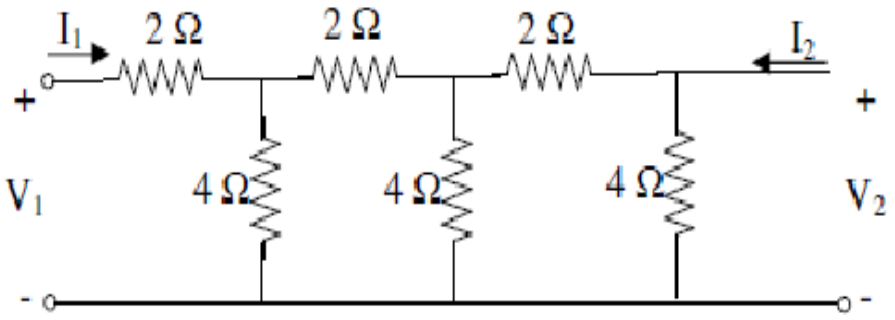


[8]

Unit-5

1. (a) Prove the conditions for symmetry and r
parame[4] ters

(b) Find abcd parameters in terms of the follow
[1 0]

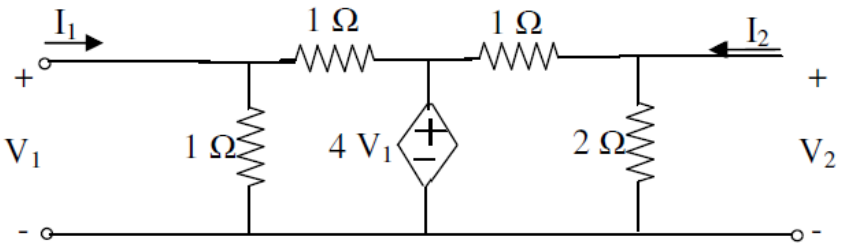


2. (a) Derive Z parameters as function of h
[6]

(b) Prove the conditions for symmetry a
transmissionli[4] e parameters

3. (a) Why Z-parameters are known as open circuit p
Y-parameters are known as sho[4] t circuit pa
(b) Derive H parameters as functi[8] n of a ABCD

4. (a) Determine Z parameters of the following circu



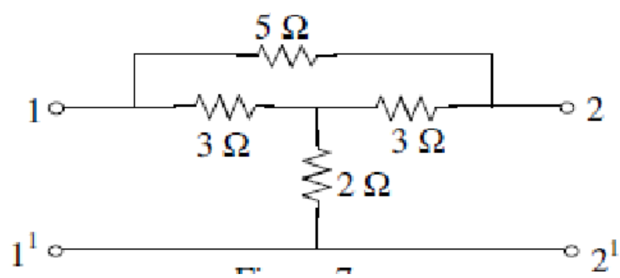
[8]

(b) Prove the conditions for symmetry and rec
transmission[4] arameters

5. (a) The Z-parameters of a two port network are $Z_{11} = 25\,\Omega$, $Z_{22} = 40\,\Omega$, $Z_{12} = Z_{21} = 20\,\Omega$. Calculate Y and **ABCD** parameters of the network. Also find the equivalent network. [8]

(b) Derive Z-parameters in terms of Y-parameters and **ABCD** parameters. [4+4]

6. Obtain the Admittance parameters of the network shown in Figure 7 and thereby obtain **ABCD** parameters.



[8]