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Total No. of Questions :5]   [Total No. of Printed Pages :6

d) Find :

i)   Z - parameters

ii) Y - parameters

OR

Obtain Z - parameters

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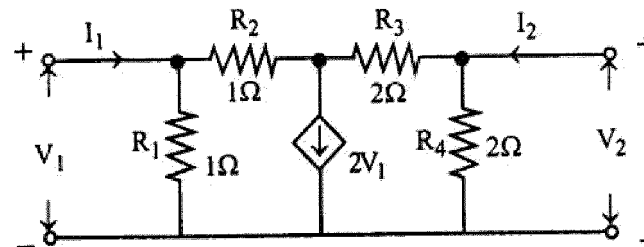
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# EI/EE/EX/BM - 305

B.E. III Semester

Examination, June 2015

Network Analysis

Time : Three Hours

Maximum Marks : 70

Note: i)   Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) What is the principle of Duality? Give one example.

b) What are non-linear inductor and non-linear capacitors?

c) Derive the expression for Q-factor of a series RLC circuit.

d) Write the voltage equation for the following winding diagram :
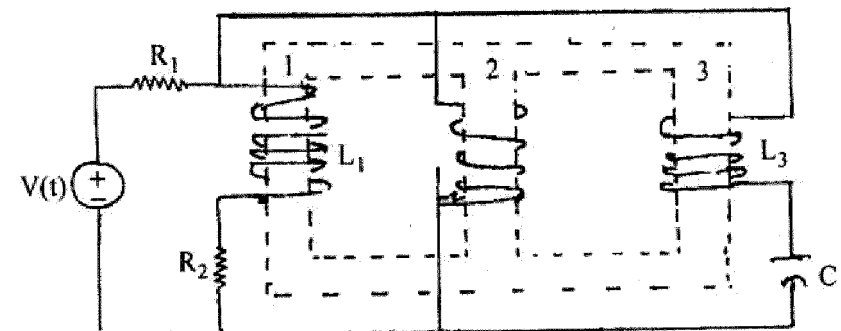
OR

What is the value of R such that the power supplied by both the sources are equal other?
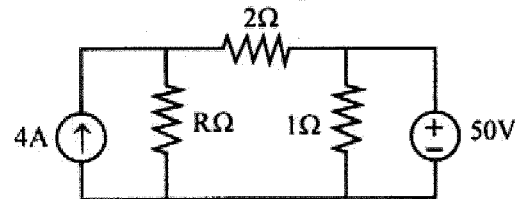

2. a) Write any two practical application of Thevenin's Theorem.

b) What do you mean by -
i) Tie set matrix ii) Cut set matrix
iii) Twig iv) Tree

c) Draw the graph of the following circuit. Select a suitable tree and write down the KVL equations from tie set matrix.
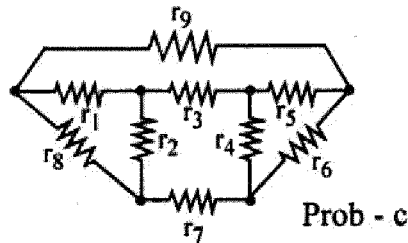
Prob - c

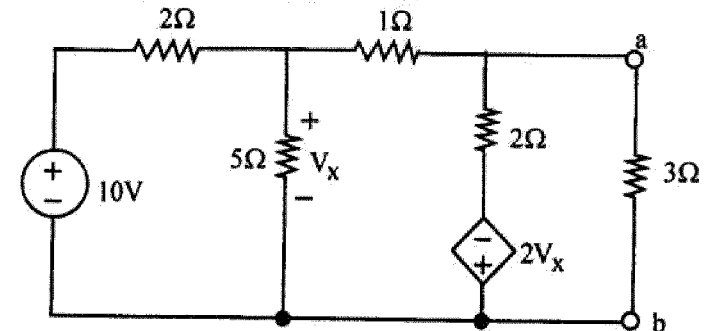d) Find the value of current I flowing through the 50Ω resistor in the bridge network shown below using Thevenin's theorem.
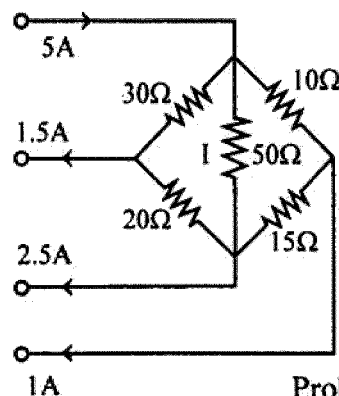

Prob - d

OR

Find the current through 3Ω resistor in the circuit of the figure below, using Norton's theorem, verify the result using Thevenin's theorem.

Prob - e

3. a) Why study of transients is required?

b) What do you mean by Resonance?

c) Explain the behaviour of the inductance parameter and the conductance parameter during transient analysis of a circuit.

d) In the network given below, a steady state is reached with switch K open. At t = 0, switch is closed. Find the value of in all the three loops at t = 0+.
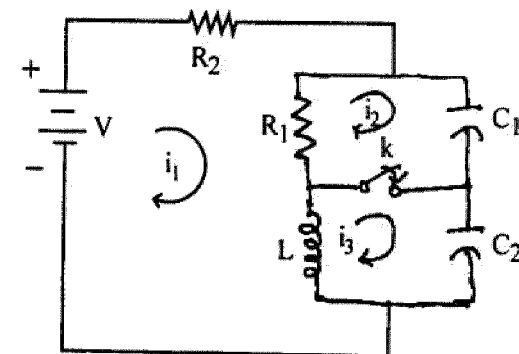
OR

A 50 Hz sinusoidal voltage $V = 311 \sin\omega t$ is applied to a RL series circuit. If the magnitude of resistance is 5Ω and that of inductance is 0.02H.

i) Calculate the RMS or effective value of steady state current and relative phase angle.

ii) Obtain the expression for instantaneous current.

iii) Compute the effective magnitude and phase of voltage drops appearing across each circuit element.

4. a) State initial value theorem.

b) Give the relation between a ramp function and a unit step function.

c) The accompanying figure shows a waveform made up of line segments. For this waveform write an equation for v (t) in terms of steps, ramps and related waveforms as needed.
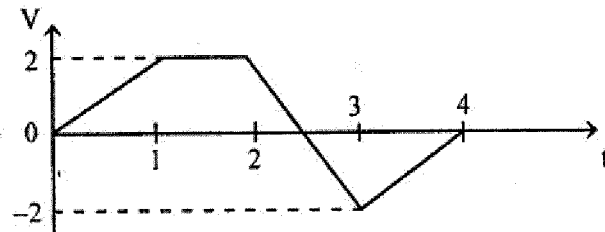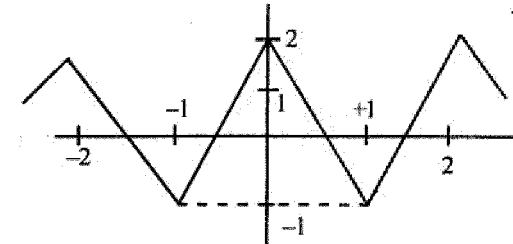

d) Assuming the initial current to be 2A through the inductor, find $V_0(t)$ in the circuit. What will be $V_0(t)$ if supply is $10e^{-t} u(t)$?
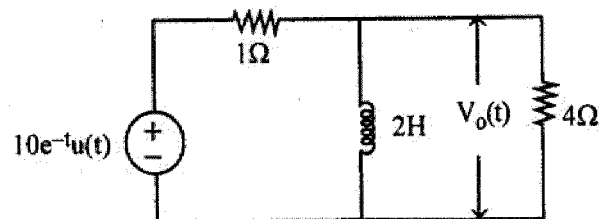
OR

Obtain the fourier series of the waveform.

5. a) What are the necessary conditions for driving point functions?

b) Why are the A,B,C,D parameters known as transmission parameters?

c) For the network of the accompanying figure and element values specified, determine $\alpha_{12} = \dfrac{I_2}{I_1}$.