Code.No: R05010401

R05

SET-1

I B.TECH – EXAMINATIONS, DECEMBER - 2010
NETWORK ANALYSIS
(COMMON TO ECE, EIE, BME, ETM, ECC)

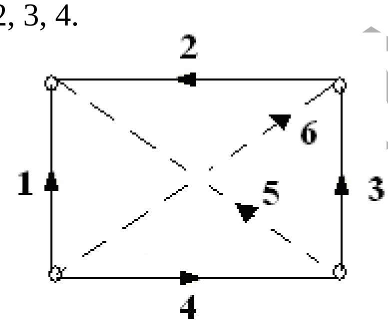
Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

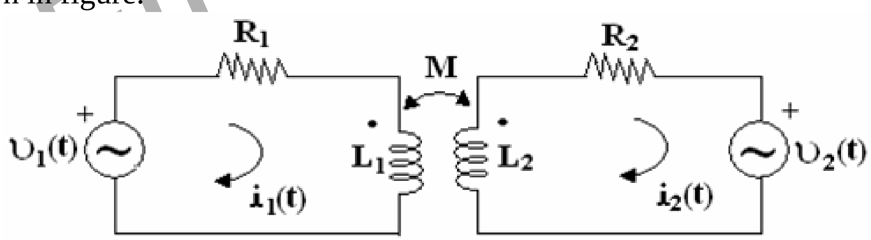
1.a) Distinguish between:
i) Ideal and practical sources and
ii) Dependent and independent sources.

b) The current in a 15 mH inductor can be expressed as $i(t)=\left[2-e^{-1000t}\right]\times10^{-3}\,Amps$.
Find:
i) The voltage across the inductor $u(t)$ and
ii) The instantaneous power $p(t)$.

c) Write the basic Tie set matrix for the graph shown in figure, taking the Tree consisting of branches 2, 3, 4. [4+6+6]



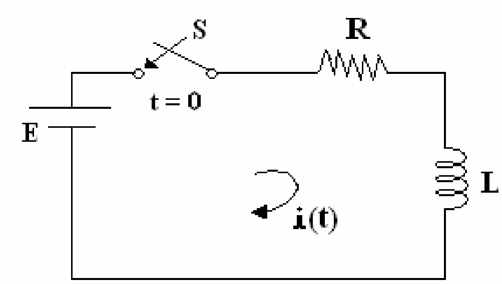
2.a) Obtain the conductively coupled T-equivalent for the magnetically coupled circuit shown in figure.



b) An Iron ring has a mean diameter of 25 cms, and a C.S. area of 4 cm^2 and is wound with 1000 Turns. An air gap of 1.5 mm width is cut in the ring. Determine the current required in the coil to produce a flux of 0.1 mwb in the air gap. The relative permeability of Iron is 800. Neglect leakage. [8+8]

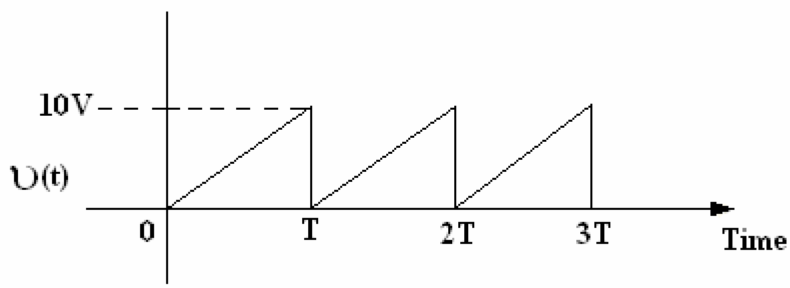
3.a) Define Q-factor. Derive an equation showing the relation between Q-factor and Band width. What is selectivity and how it is related to Q-factor.

b) Derive the expression for $i(t)$ when the switch S is suddenly closed at t = 0 in the circuit shown in figure. Sketch the variation of $i(t)$, $v_R(t)$ and $v_L(t)$ with respect to Time.



What is the time constant of the above circuit and explain its significance? [8+8]

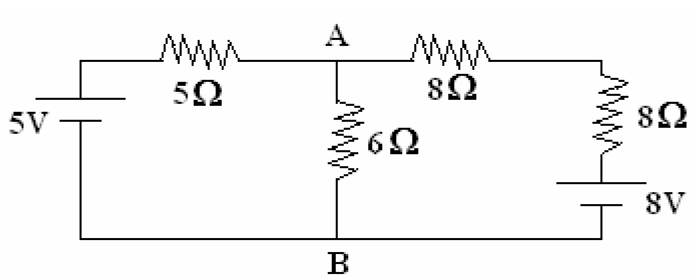
4.a) Define RMS value, Average value and form factor of an alternating quantity. Determine these values for the periodic function shown in figure.



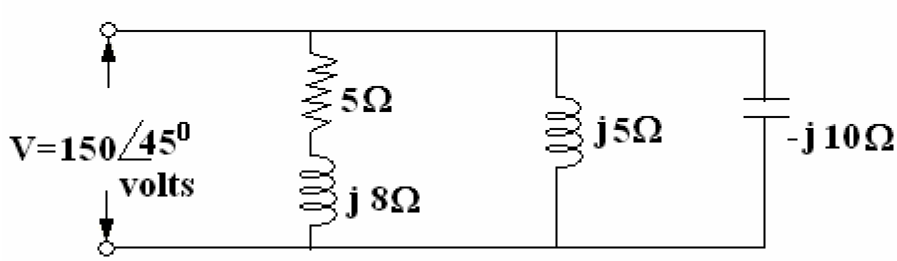
b) A series R-L circuit with R = 5 ohms and L = 0.2H has an applied voltage source of $\upsilon(t) = 10e^{-100t}$ applied at t = 0. Determine the current through the circuit $i(t)$. Use Laplace Transform method of solution. [8+8]

5.a) State and explain Norton's Theorem.

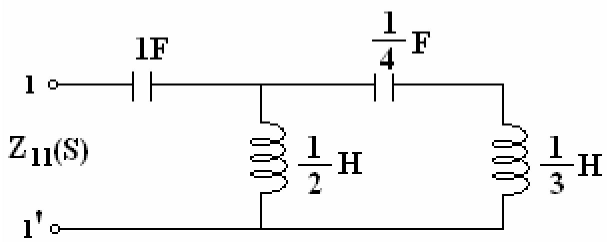
b) Obtain Norton's Equivalent for the circuit shown with respect to terminals A and B.



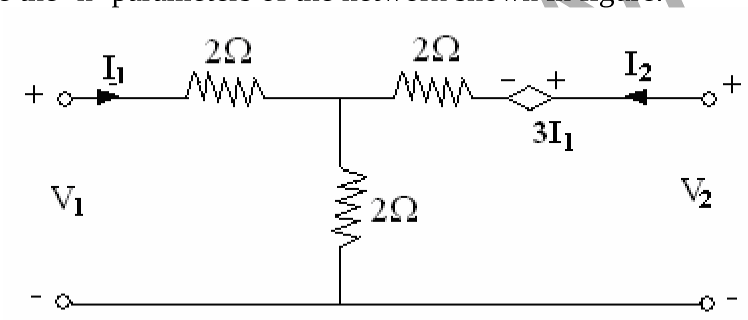
c) Obtain the branch currents in the circuit shown and draw the phasor diagram. [4+6+6]



6.a) Find the driving point impedance function $Z_{11}(S)$ of the LC network shown in figure.



b) Determine the 'h' parameters of the network shown in figure. [8+8]



7.a) Explain clearly the following terms:
i) Propagation constant and
ii) Attenuation.

b) A symmetrical T-section has an inductance of 0.47H in each series arm and a 300 μF capacitor in the shunt arm.
i) Find the characteristic impedance at frequencies of 50 Hz and 100 Hz.
ii) If the T-section is terminated in the characteristic impedance, find the ratio of load current to input current at both the frequencies. [6+10]

8.a) What is an LC immittance function? State the properties of such functions.

b) Design a constant 'K' T-section low pass filter having cutoff frequency of 2 kHz and nominal characteristic impedance of 600 ohms. [8+8]

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R05

SET-2

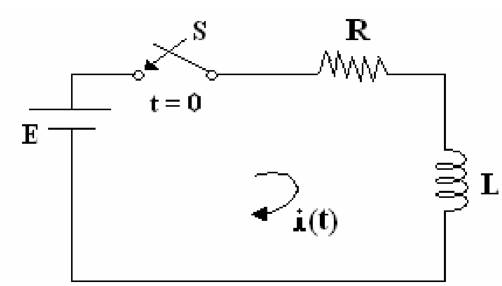
I B.TECH – EXAMINATIONS, DECEMBER - 2010
NETWORK ANALYSIS
(COMMON TO ECE, EIE, BME, ETM, ECC)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

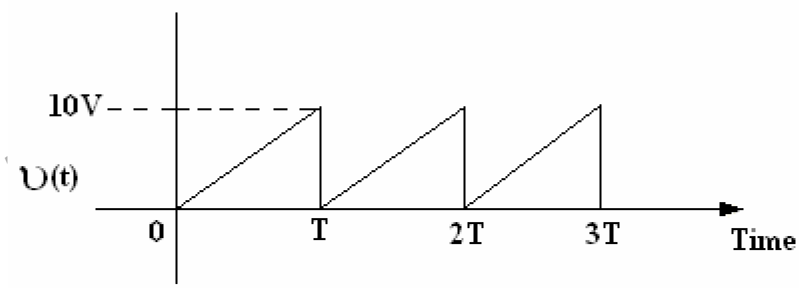
1.a) Define Q-factor. Derive an equation showing the relation between Q-factor and Band width. What is selectivity and how it is related to Q-factor.

b) Derive the expression for $i(t)$ when the switch S is suddenly closed at t = 0 in the circuit shown in figure. Sketch the variation of $i(t)$, $v_R(t)$ and $v_L(t)$ with respect to Time.



What is the time constant of the above circuit and explain its significance? [8+8]

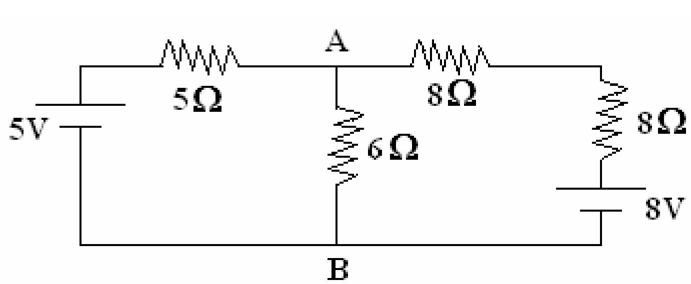
2.a) Define RMS value, Average value and form factor of an alternating quantity. Determine these values for the periodic function shown in figure.



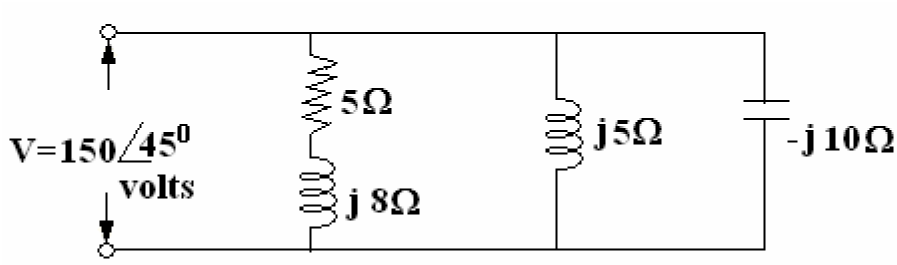
b) A series R-L circuit with R = 5 ohms and L = 0.2H has an applied voltage source of $\upsilon(t) = 10e^{-100t}$ applied at t = 0. Determine the current through the circuit $i(t)$. Use Laplace Transform method of solution. [8+8]

3.a) State and explain Norton's Theorem.

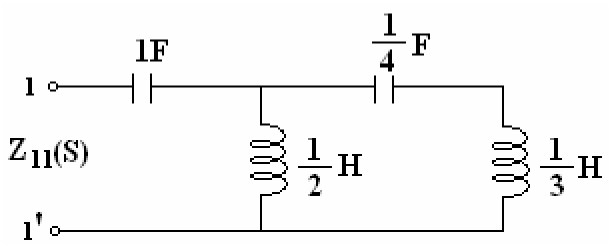
b) Obtain Norton's Equivalent for the circuit shown with respect to terminals A and B.



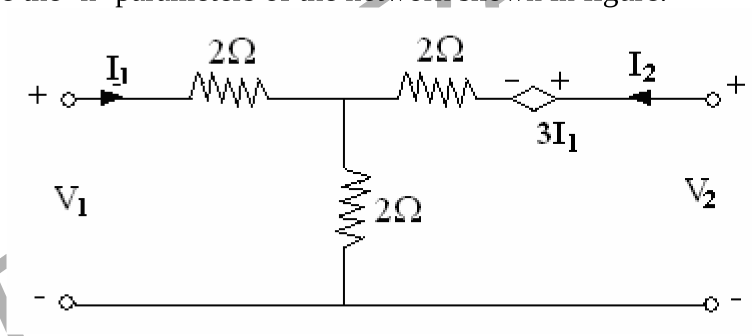
c) Obtain the branch currents in the circuit shown and draw the phasor diagram. [4+6+6]



4.a) Find the driving point impedance function $Z_{11}(S)$ of the LC network shown in figure.



b) Determine the 'h' parameters of the network shown in figure. [8+8]



5.a) Explain clearly the following terms:
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b) A symmetrical T-section has an inductance of 0.47H in each series arm and a 300 μF capacitor in the shunt arm.
i) Find the characteristic impedance at frequencies of 50 Hz and 100 Hz.
ii) If the T-section is terminated in the characteristic impedance, find the ratio of load current to input current at both the frequencies. [6+10]

6.a) What is an LC immittance function? State the properties of such functions.

b) Design a constant 'K' T-section low pass filter having cutoff frequency of 2 kHz and nominal characteristic impedance of 600 ohms. [8+8]

7.a) Distinguish between:
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b) The current in a 15 mH inductor can be expressed as $i(t) = \left[2 - e^{-1000t}\right] \times 10^{-3}\, Amps$.
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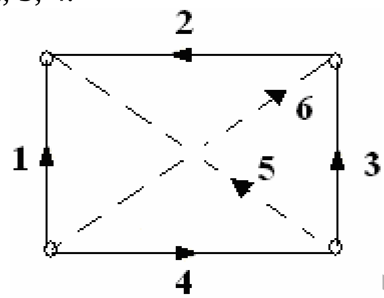
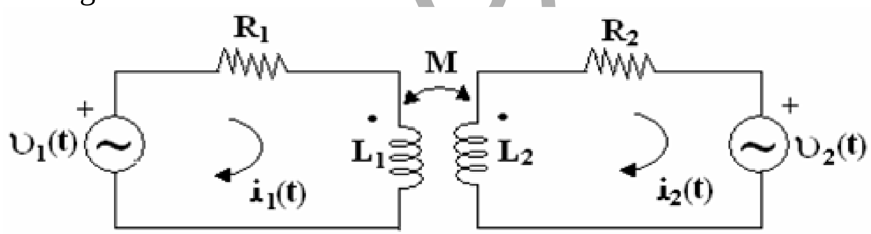
c) Write the basic Tie set matrix for the graph shown in figure, taking the Tree consisting of branches 2, 3, 4. [4+6+6]



8.a) Obtain the conductively coupled T-equivalent for the magnetically coupled circuit shown in figure.



b) An Iron ring has a mean diameter of 25 cms, and a C.S. area of 4 cm^2 and is wound with 1000 Turns. An air gap of 1.5 mm width is cut in the ring. Determine the current required in the coil to produce a flux of 0.1 mwb in the air gap. The relative permeability of Iron is 800. Neglect leakage. [8+8]

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R05

SET-3

I B.TECH – EXAMINATIONS, DECEMBER - 2010
NETWORK ANALYSIS
(COMMON TO ECE, EIE, BME, ETM, ECC)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
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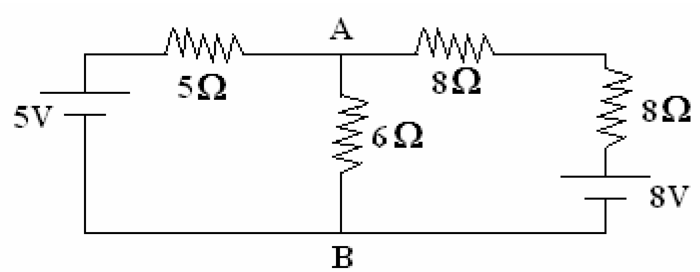
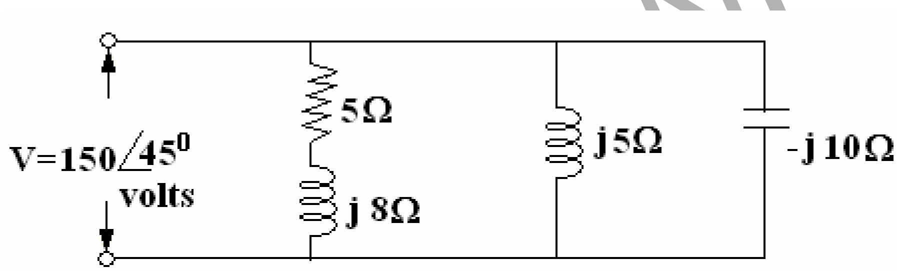


c) Obtain the branch currents in the circuit shown and draw the phasor diagram. [4+6+6]



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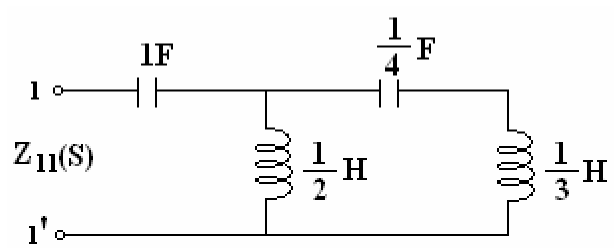
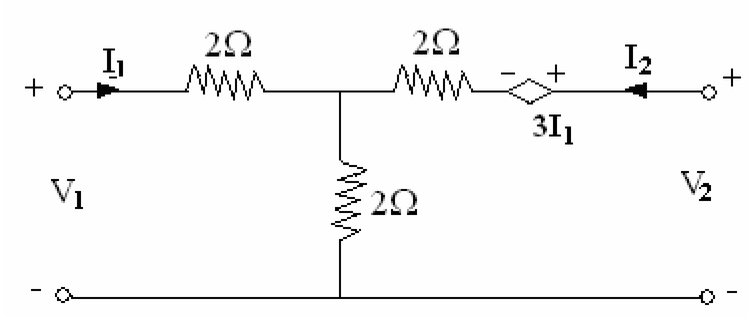


b) Determine the 'h' parameters of the network shown in figure. [8+8]



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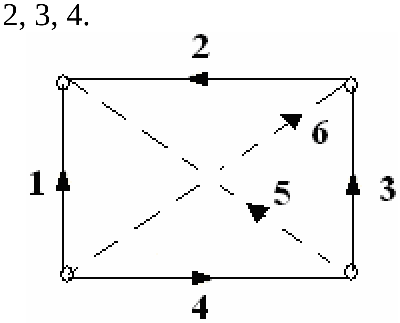

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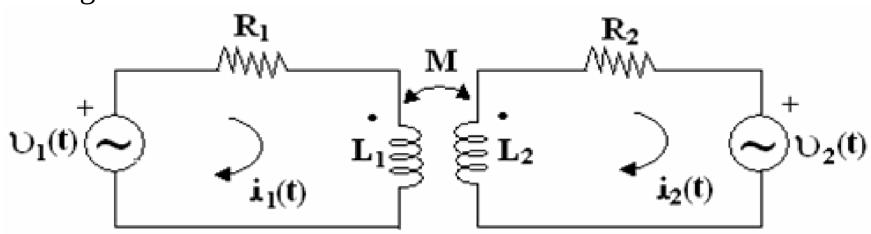

b) An Iron ring has a mean diameter of 25 cms, and a C.S. area of 4 cm^2 and is wound with 1000 Turns. An air gap of 1.5 mm width is cut in the ring. Determine the current required in the coil to produce a flux of 0.1 mwb in the air gap. The relative permeability of Iron is 800. Neglect leakage. [8+8]

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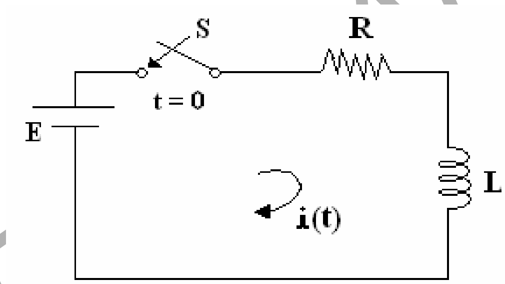
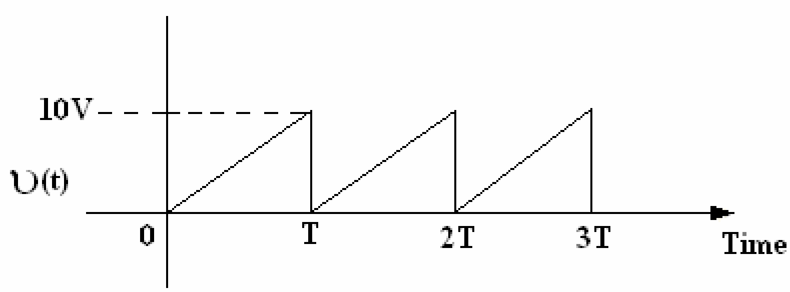


What is the time constant of the above circuit and explain its significance? [8+8]

8.a) Define RMS value, Average value and form factor of an alternating quantity. Determine these values for the periodic function shown in figure.



b) A series R-L circuit with R = 5 ohms and L = 0.2H has an applied voltage source of $\upsilon(t) = 10e^{-100t}$ applied at t = 0. Determine the current through the circuit $i(t)$. Use Laplace Transform method of solution. [8+8]

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Code.No: R05010401

R05

SET-4

I B.TECH – EXAMINATIONS, DECEMBER - 2010
NETWORK ANALYSIS
(COMMON TO ECE, EIE, BME, ETM, ECC)

Time: 3hours **Max.Marks:80**

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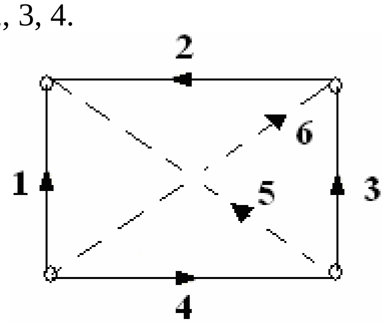
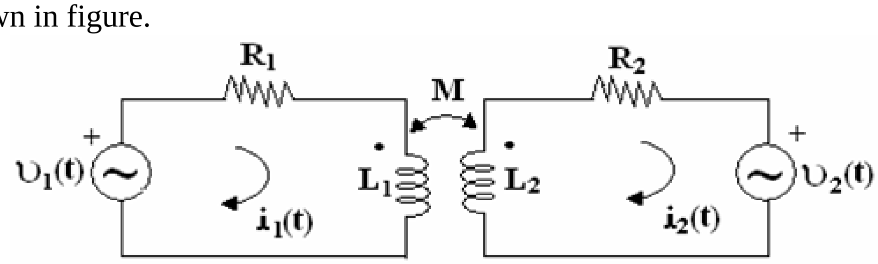


4.a) Obtain the conductively coupled T-equivalent for the magnetically coupled circuit shown in figure.



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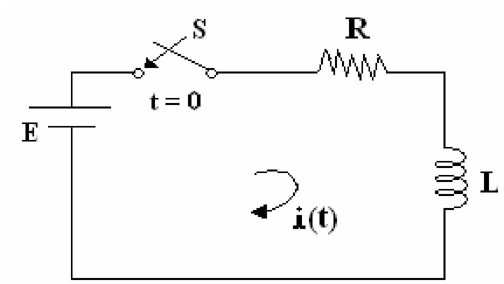

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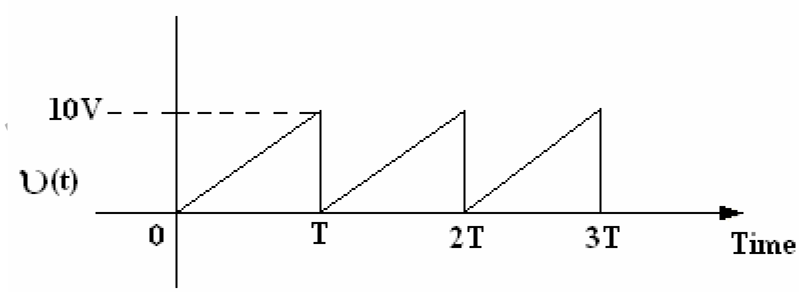
6.a) Define RMS value, Average value and form factor of an alternating quantity. Determine these values for the periodic function shown in figure.



b) A series R-L circuit with R = 5 ohms and L = 0.2H has an applied voltage source of $\upsilon(t) = 10e^{-100t}$ applied at t = 0. Determine the current through the circuit $i(t)$. Use Laplace Transform method of solution. [8+8]

Code.No: R05010401

R05

SET-4

7.a) State and explain Norton's Theorem.

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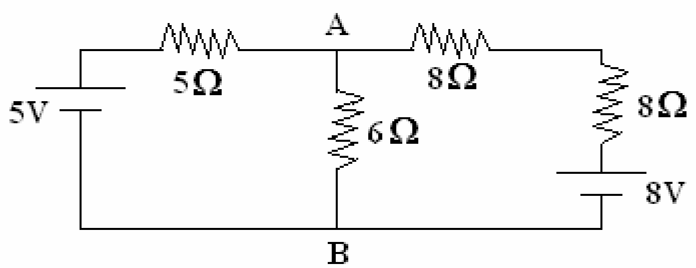
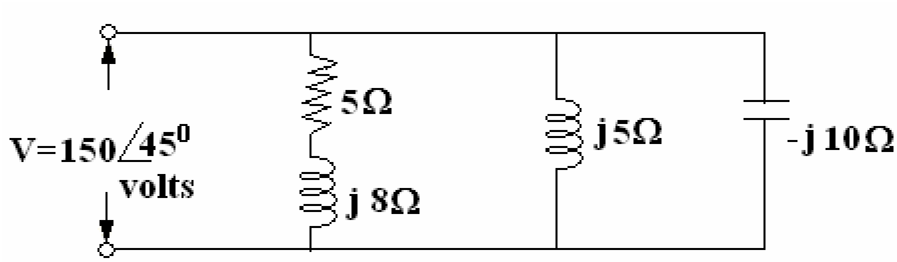


c) Obtain the branch currents in the circuit shown and draw the phasor diagram. [4+6+6]



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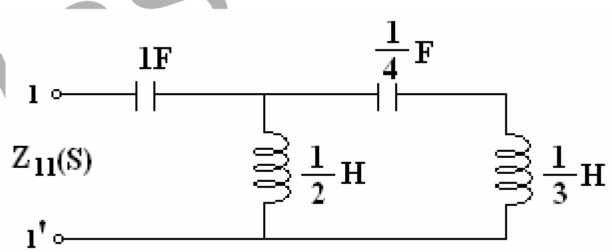
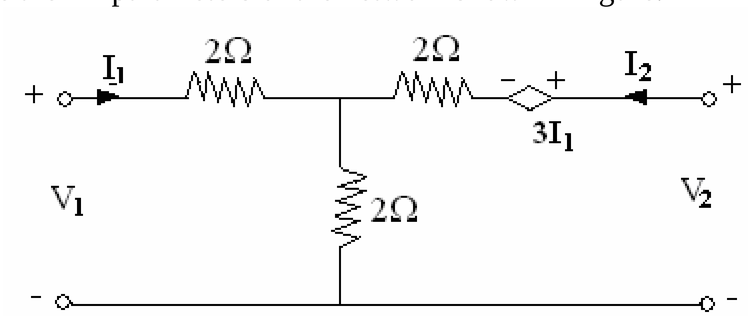


b) Determine the 'h' parameters of the network shown in figure. [8+8]



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