Code No: 07A1EC05 **Set No. 1**

I B.Tech Supplimentary Examinations, Aug/Sep 2008
NETWORK ANALYSIS
(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering, Bio-Medical Engineering, Electronics & Control Engineering, Electronics & Telematics and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Two resistors $R_1 = 2500\ \Omega$ and $R_2 = 4000\ \Omega$ are joined in series and connected to a 100 V supply. The voltage drop across R_1 and R_2 are measured successively by a volt meter having a resistance of 50000 Ω. Find the sum of the readings. [16]

2. A 15 mH coil is connected in series with another coil. The total inductance is 70 mH. When one of the coils is reversed, the total inductance is 30 mH. Find the inductance of second coil, mutual inductance and coefficient of coupling. Derive the expression used. [16]

3. A series RLC resonant circuit connected across a supply of 10V, is made up of R = 25 Ω, L = 0.1 H and C = 25 μF. Find [16]
   (a) maximum current in the circuit
   (b) current at half power frequency
   (c) maximum power drawn from the supply
   (d) BW and
   (e) Q.

4. For the graph shown in figure 4, write the tie-set schedule and obtain the relation between branch currents and link currents. [16]

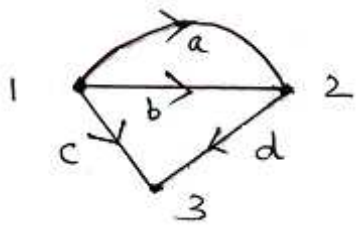

Figure 4

5. State and Explain with proof of Reciprocity Theorem. [16]

6. Derive the relationship between Y parameters and Z - parameters. [16]

7. In the circuit shown in figure 7, E_g (t) = 2.5 t Volts. What are the values of i(t) and VL(t) at t = 4 seconds. [16]

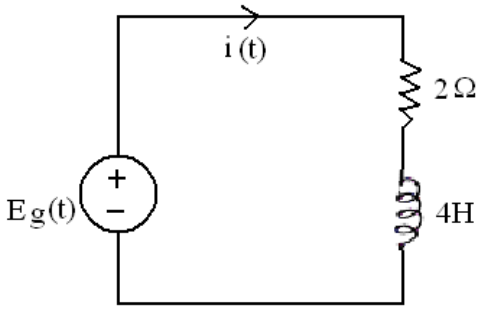

Figure 7

8. Design a m-derived filter to provide high attenuation at f∞ = 1065 cycles and to have a cut - off frequency of 1000 cycles and load resistance of 500 ohm. [16]

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Code No: 07A1EC05 **Set No. 2**

I B.Tech Supplimentary Examinations, Aug/Sep 2008
NETWORK ANALYSIS
(Common to Electronics & Communication Engineering, Electronics & Instrumentation Engineering, Bio-Medical Engineering, Electronics & Control Engineering, Electronics & Telematics and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. For the figure 1 shown, calculate the equivalent resistance of the following combination of resistors and also calculate the source current, total power dissipated. [16]

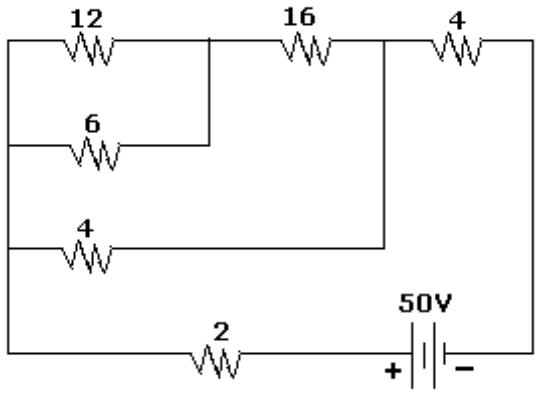

Figure 1

2. Derive expressions for voltage, current and power in a capacitor supplied with an alternating sinusoidal voltage. [16]

3. An inductive circuit of resistance 2 Ω and inductance 0.01 H is connected to a 250V, 50Hz supply. What capacitance must be connected in parallel with this inductive circuit to produce resonance. Find the total current from the supply and the current in each branch. [16]

4. Draw the graph of the network shown in the figure 4. Obtain a tree thereof. What is the number of mesh currents required for the network. [16]

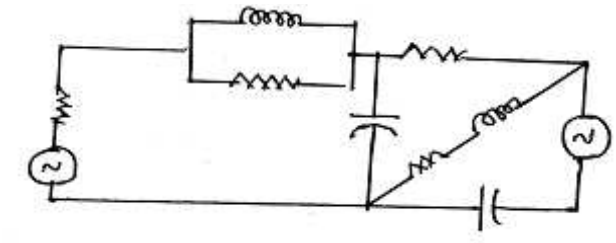

Figure 4

5. (a) State and explain Thevenin's Theorem.

(b) What are the limitations of Thevenin's Theorem.

(c) Explain the steps to apply Thevenin's Theorem and draw the Thevenin's equivalent circuit. [6+4+6]

6. Find the Y - parameters for the bridged T-network, as shown in figure 6. [16]

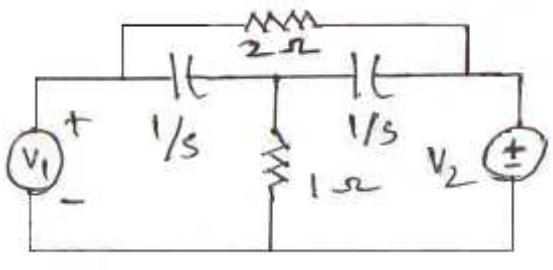

Figure 6

7. In the circuit shown in figure 7, E_g (t) = 2.5 t Volts. What are the values of i(t) and VL(t) at t = 4 seconds. [16]

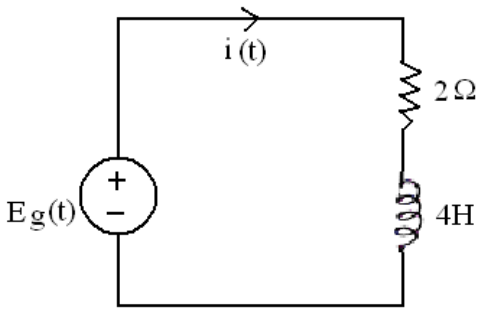

Figure 7

8. Design a m-derived low pass filter having cut-off frequency of 1 KHz, design impedance of 400Ω and the resonant frequency is 1100Hz. [16]

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Code No: 07A1EC05 **Set No. 3**

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Three resistors 8 ohms, 6 ohms and 10 ohms are connected in series to a battery of terminal voltage 24 volts. Find the current in the circuit, P.D. across each resistor and power dissipated in each resistor. [16]

2. The resistor R in series with capacitance C is connected to a 50Hz, 240 V supply. Find the value of C so that R absorbs 300 watts at 100 volts. Find also the maximum charge and the maximum stored energy in C. [16]

3. Determine the value of the capacitance C in order that the circuit in the figure 3 is resonant at 6366 Hz. [16]

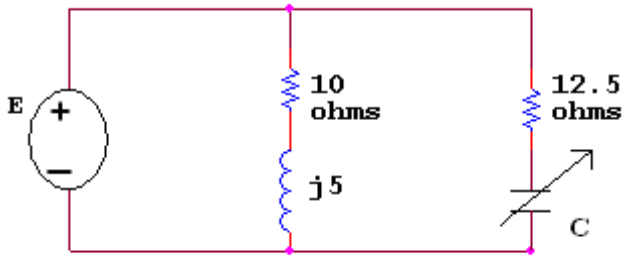

Figure 3

4. For the network shown in figure 4 find the tie-set matrix loop current. [16]

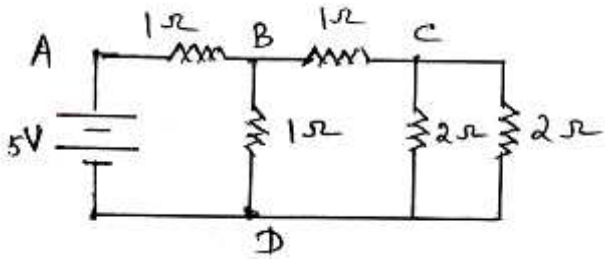

Figure 4

5. (a) State and explain Thevenin's Theorem.
   (b) What are the limitations of Thevenin's Theorem.
   (c) Explain the steps to apply Thevenin's Theorem and draw the Thevenin's equivalent circuit. [6+4+6]

6. Find the transmission parameters of the network as shown in figure 6. [16]

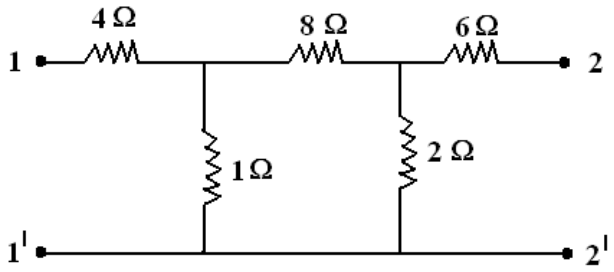

Figure 6

7. A DC voltage of 100V is applied in the adjoining circuit as shown in the figure 7 and the switch K is open. The switch K is closed at t = 0. Find the complete expression for the current. [16]

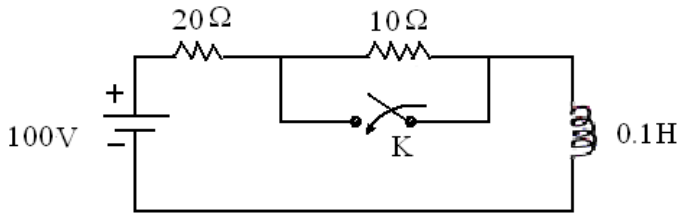

Figure 7

8. Design a composite LPF with cut off frequency = 2000 Hz, nominal impedance is 500 ohms and frequency of infinite attenuation of 2050 Hz. [16]

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Code No: 07A1EC05 **Set No. 4**

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Derive an expression to convert a given 3-phase star connected circuit to equivalent delta connection. [16]
2. Derive expression for R.M.S. and average value of a sinusoidal alternating quantity. [16]
3. (a) Explain the phenomenon of resonance. Derive the formula for the resonant frequency of the series resonant circuit.
   (b) Give the quality factor in terms of Bandwidth.
   (c) Find the natural frequency of a series RLC circuit in which R = 200 ohms, L = 0.15 H and C = 5 micro Farads. [8+4+4]
4. For the circuit shown in figure 4 draw the oriented graph, select a tree and obtain the tie-set schedule. [16]

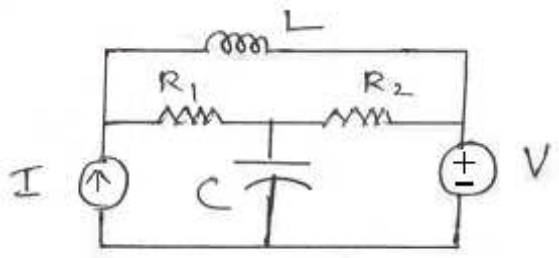

Figure 4

5. Obtain Norton's equivalent across terminals A and B for network shown in figure 5. [16]

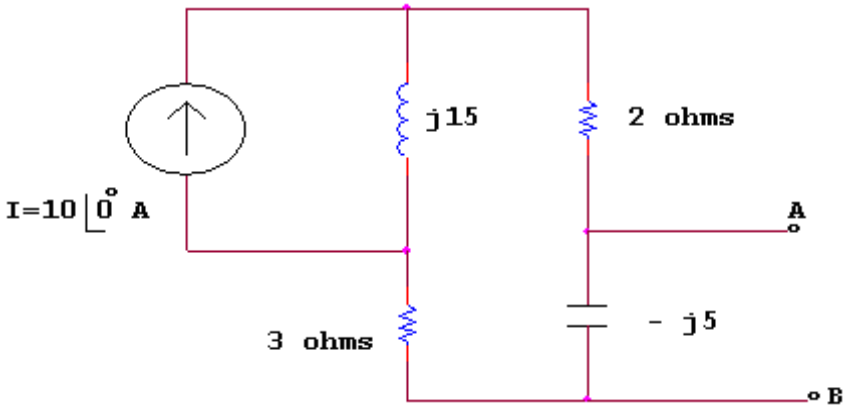

Figure 5

6. Find the Z parameters of the Π network shown in figure 6 & prove that the circuit is receprocal. [16]

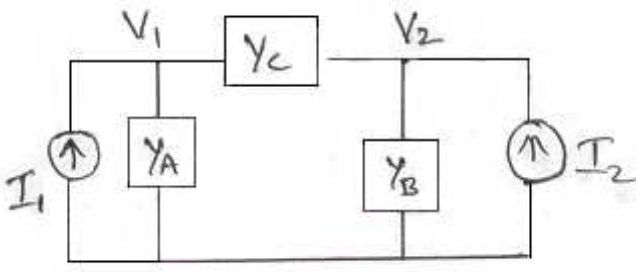

Figure 6

7. Derive the transient response of RLC series circuit with unit step input. [16]

8. Describe a prototype T section band stop filter. Determine the formula required for designing band stop filter. With suitable sketches explain the advantages of m-derived band stop filter. [16]

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