Code No: R07A1EC02 **R07** **Set No. 2**

I B.Tech Examinations,December 2010
ELECTRICAL CIRCUIT ANALYSIS
Common to Instrumentation And Control Engineering, Electrical And Electronics Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Find the Z and Y parameters of the circuit shown in figure 2. [16]

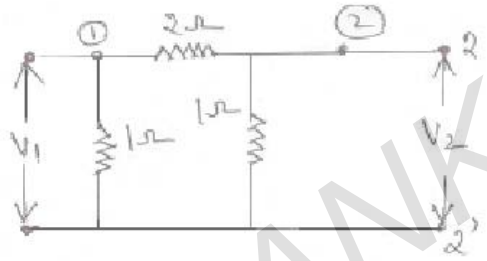

Figure 2

2. Draw the graph of the lattice network shown in the figure 7. Deduce the tie-set and cut-set matrices, and from those, find the relationship between independent and dependent variables. [16]

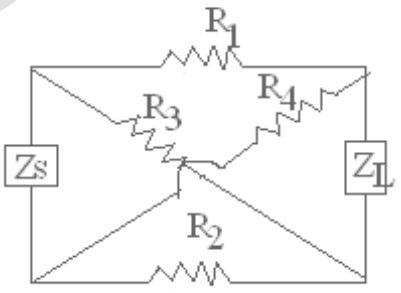

Figure 7

3. Two impedances (15-j10) Ω and (10+j15) Ω are connected in parallel. The supply voltage is 200V, 50Hz. Calculate
   (a) The admittance
   (b) Conductance
   (c) Susceptance of the combined circuit
   (d) Total current and
   (e) Total power factor
   (f) Total power consumed is each branch and total power. [16]

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4. Derive an expression for current response of RLC series circuit with sinusoidal excitation. Assume the circuit is working in critical damping conditions. [16]

5. (a) Calculate load current I_L using Millman's theorem as shown in figure 4a.

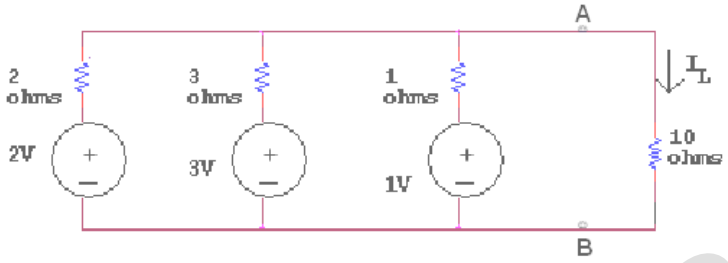

Figure 4a

(b) State and explain the theorems in voltage and current source representations. [6+10]

6. (a) Derive an expression for the energy stored in an inductor and a capacitor.

(b) Obtain an expression for Co-efficient of coupling. [10+6]

7. A three phase, 4 wire, 400V, 50Hz system supplies a load of 50KW at a power factor of 0.75 lagging between the red phase and neutral; 60KW at a power factor of 0.85 leading between the yellow phase and neutral and 70KW at unity power factor between the blue phase and neutral. Find the current in the neutral conductor. [16]

8. (a) State and explain the Kirchhoff's Law which can be applied to loop current method.

(b) For the network shown in figure 1b, determine the equivalent resistance between the terminals A and B, if each resistance value is equal to 1 ohms. [6+10]

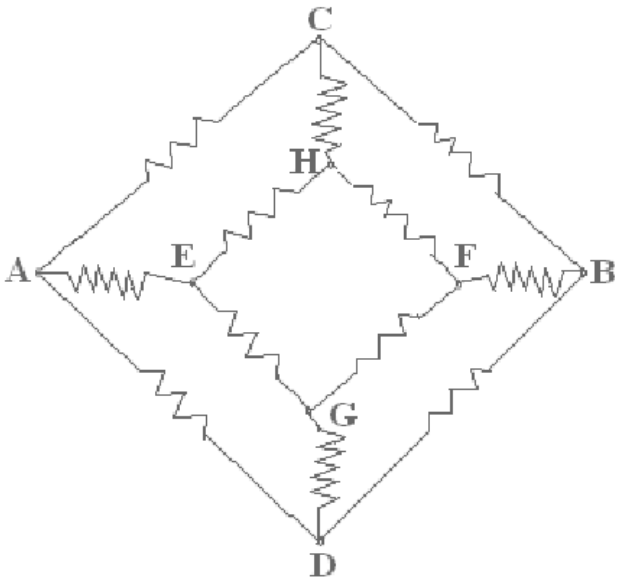

Figure 1b

Code No: R07A1EC02 **R07** **Set No. 2**

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Code No: R07A1EC02 **R07** **Set No. 4**

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1. (a) Derive an expression for the energy stored in an inductor and a capacitor.
   (b) Obtain an expression for Co-efficient of coupling. [10+6]
2. (a) State and explain the Kirchhoff's Law which can be applied to loop current method.
   (b) For the network shown in figure 1b, determine the equivalent resistance between the terminals A and B, if each resistance value is equal to 1 ohms. [6+10]

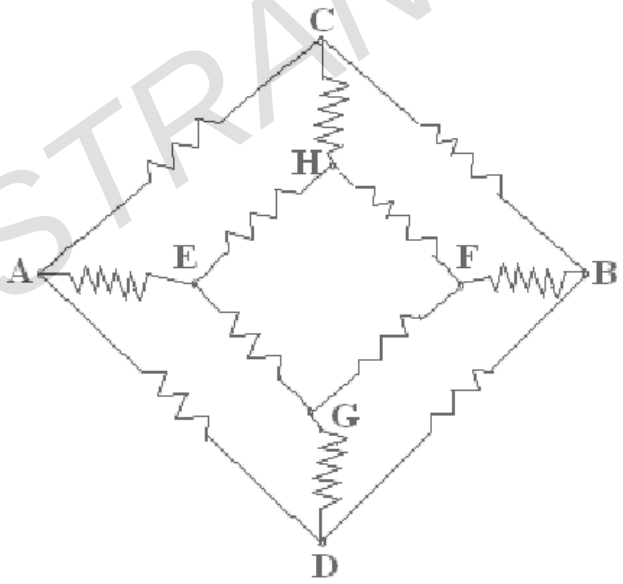

Figure 1b

3. (a) Calculate load current I_L using Millman's theorem as shown in figure 4a.

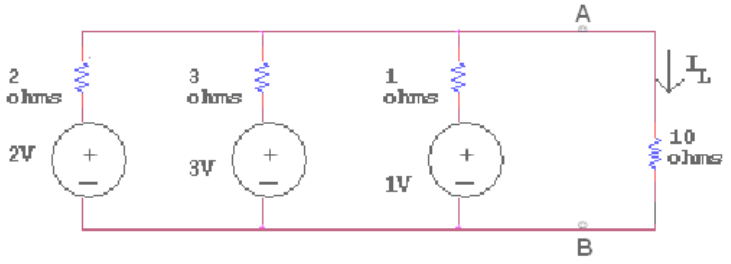

Figure 4a

   (b) State and explain the theorems in voltage and current source representations. [6+10]

Code No: R07A1EC02 **R07** **Set No. 4**

4. Find the Z and Y parameters of the circuit shown in figure 2. [16]

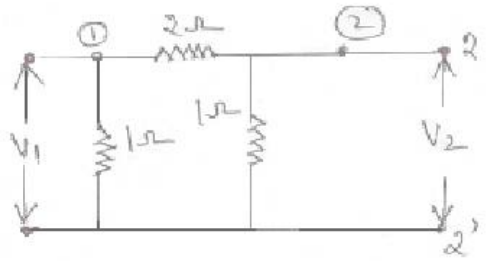

Figure 2

5. Draw the graph of the lattice network shown in the figure 7. Deduce the tie-set and cut-set matrices, and from those, find the relationship between independent and dependent variables. [16]

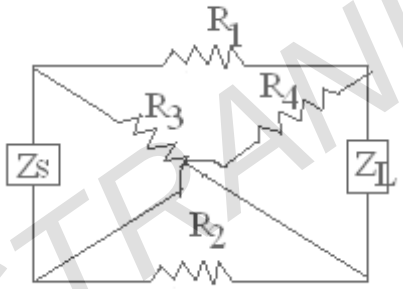

Figure 7

6. Derive an expression for current response of RLC series circuit with sinusoidal excitation. Assume the circuit is working in critical damping conditions. [16]

7. A three phase, 4 wire, 400V, 50Hz system supplies a load of 50KW at a power factor of 0.75 lagging between the red phase and neutral; 60KW at a power factor of 0.85 leading between the yellow phase and neutral and 70KW at unity power factor between the blue phase and neutral. Find the current in the neutral conductor. [16]

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   (d) Total current and
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Code No: R07A1EC02 **R07** **Set No. 1**

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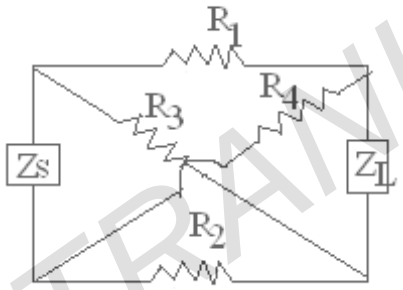

Figure 7

2. (a) Derive an expression for the energy stored in an inductor and a capacitor.
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4. Find the Z and Y parameters of the circuit shown in figure 2. [16]

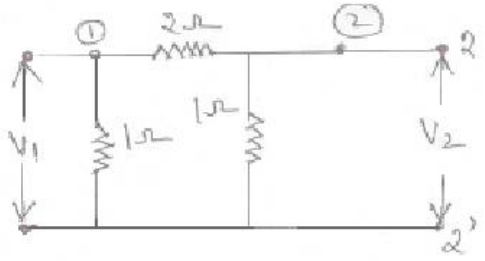

Figure 2

5. (a) State and explain the Kirchhoff's Law which can be applied to loop current method.

(b) For the network shown in figure 1b, determine the equivalent resistance between the terminals A and B, if each resistance value is equal to 1 ohms. [6+10]

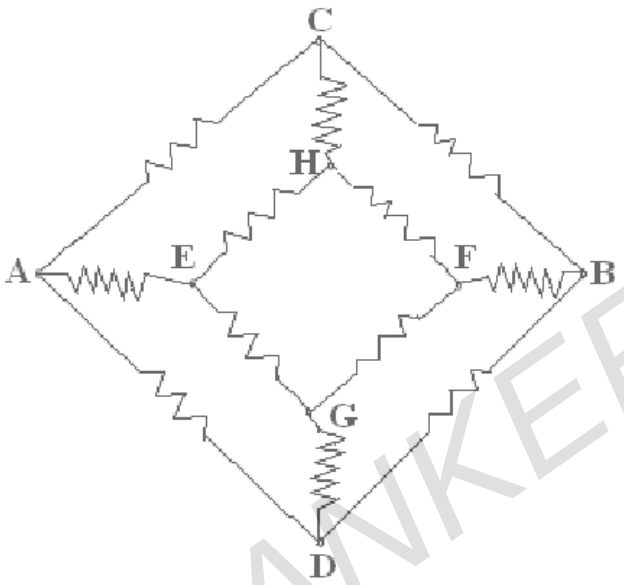

Figure 1b

6. Two impedances (15-j10) Ω and (10+j15) Ω are connected in parallel. The supply voltage is 200V, 50Hz. Calculate
   (a) The admittance
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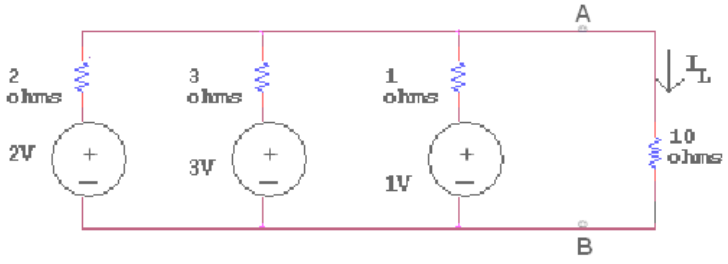

Figure 4a

(b) State and explain the theorems in voltage and current source representations. [6+10]

Code No: R07A1EC02 **R07** **Set No. 1**

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Code No: R07A1EC02 **R07** **Set No. 3**

I B.Tech Examinations,December 2010
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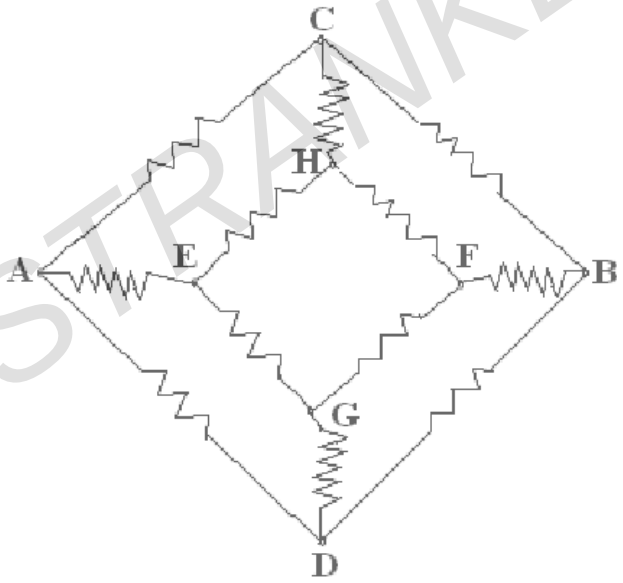

Figure 1b

2. Find the Z and Y parameters of the circuit shown in figure 2. [16]

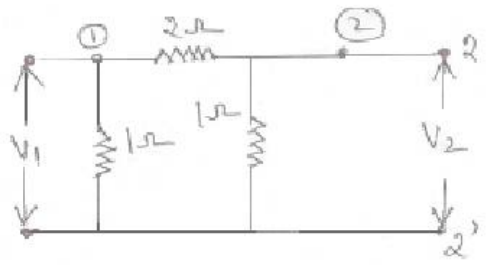

Figure 2

3. (a) Derive an expression for the energy stored in an inductor and a capacitor.
   (b) Obtain an expression for Co-efficient of coupling. [10+6]

Code No: R07A1EC02 **R07** **Set No. 3**

4. (a) Calculate load current I_L using Millman's theorem as shown in figure 4a.

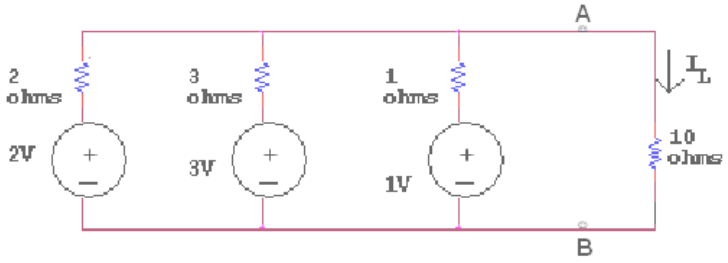

Figure 4a

(b) State and explain the theorems in voltage and current source representations. [6+10]

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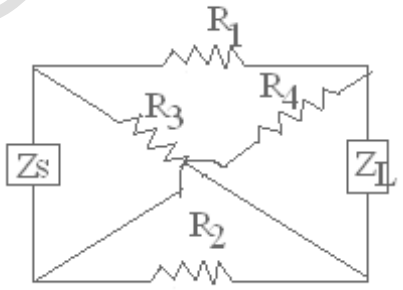

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