Code.No: R05010203 | R05 | SET-1

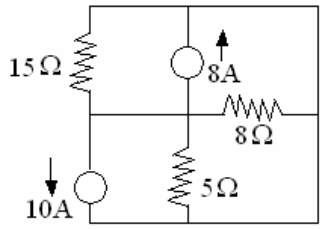
I B.TECH – EXAMINATIONS, DECEMBER - 2010
ELECTRICAL CIRCUITS
(COMMON TO EEE, E.CON.E, ICE)

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

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

1.a) Explain clearly the following:
i) Active and Passive elements
ii) Linear and Non linear elements
iii) Unilateral and Bilateral elements.

b) Determine the voltage drop across the 8 ohms resistor in the circuit shown using Kirchoff's law. [6+10]



2.a) Clearly explain the following:
i) Self inductance (L)
ii) Mutual inductance (M)
iii) Dot convention.

b) An Iron ring of mean length 50 cms has an air gap of 1 mm and a winding of 200 Turns. If the relative permeability of the Iron is 400, when a current of 1 Amp flows in the winding, determine the flux density Neglect leakage and fringing.

c) State and explain Faraday's laws of electro magnetic induction. [6+6+4]

3.a) Define RMS value, Average value and form factor of an alternating quantity. Determine these values for a half wave rectified sine wave.

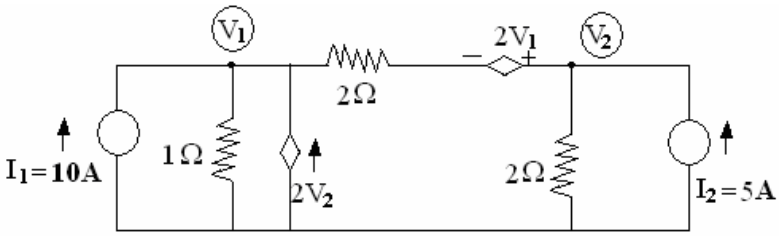
b) A coil of 20 ohms resistance and inductance of 0.2H is connected in parallel with a capacitor of $100\,\mu F$. Determine the resonant frequency & input impedance at Resonance. [8+8]

4.a) Explain Two wattmeter method of measurement of power in a 3 phase system. Derive the expressions for the readings of two watt meters for measurement of power in a balanced 3 phase load.

b) Each phase of a balanced star connected load consists of R = 10 ohms and C = $10\,\mu F$. Calculate the line current and total real and reactive powers when a symmetrical 400V, 50 Hz, 3phase supply is applied to it. [8+8]

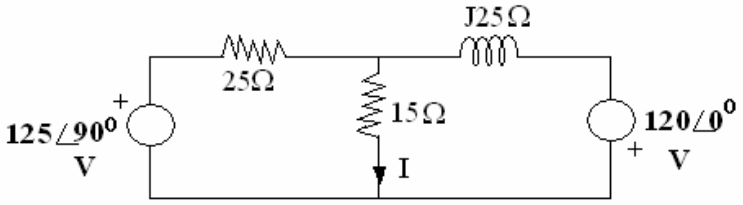
Code.No: R05010203	R05	SET-1

5.a) Find the values of V_1 and V_2 in the network shown using Nodal method of Analysis.



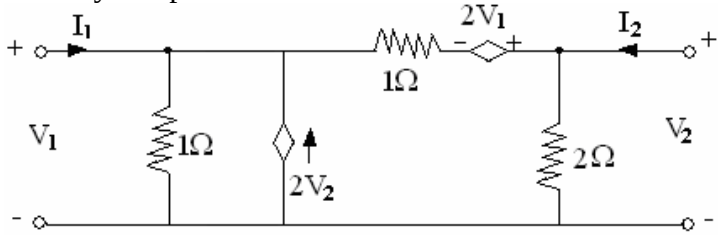
b) Define and explain the following with an example:
i) Oriented Graph
ii) Tree of a Graph
iii) Tie set and a basic Tie set
iv) Cut set and a basic Cut set. [10+6]

6.a) State and explain Superposition Theorem.
b) Determine the current I in the circuit shown using Superposition Theorem and Millman's Theorem. [4+12]



7. A series RLC circuit with R = 3Ω, L = 1H and C = 0.5F, is excited by a unit step voltage. Obtain the expression for I(t) using Laplace Transform method. Assume that the circuit is initially relaxed. Sketch the variation of I(t) and state whether the circuit is over damped, or under damped or critically damped. [16]

8.a) Define Hybrid parameters of a Two Port network. Establish the relation between Hybrid Parameters and ABCD Parameters.
b) Determine the Hybrid parameters for the Two Port network shown in figure.[8+8]



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Code.No: R05010203 | R05 | SET-2

I B.TECH – EXAMINATIONS, DECEMBER - 2010
ELECTRICAL CIRCUITS
(COMMON TO EEE, E.CON.E, ICE)

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

Answer any FIVE questions
All questions carry equal marks

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1.a) Define RMS value, Average value and form factor of an alternating quantity. Determine these values for a half wave rectified sine wave.

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2.a) Explain Two wattmeter method of measurement of power in a 3 phase system. Derive the expressions for the readings of two watt meters for measurement of power in a balanced 3 phase load.

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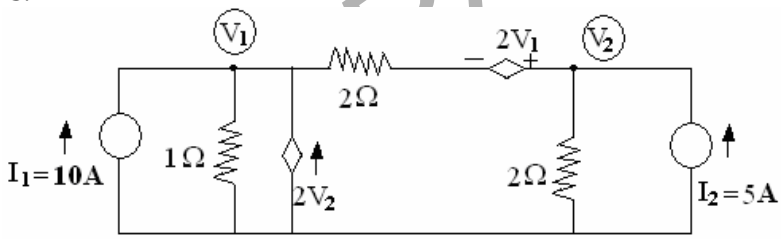
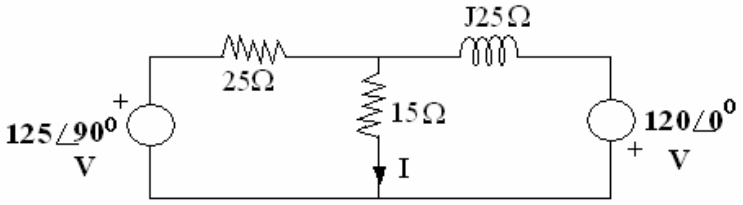
3.a) Find the values of V_1 and V_2 in the network shown using Nodal method of Analysis.



b) Define and explain the following with an example:
i) Oriented Graph
ii) Tree of a Graph
iii) Tie set and a basic Tie set
iv) Cut set and a basic Cut set. [10+6]

4.a) State and explain Superposition Theorem.

b) Determine the current I in the circuit shown using Superposition Theorem and Millman's Theorem. [4+12]

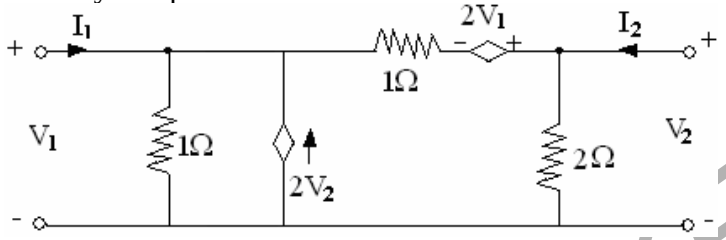


Code.No: R05010203 | R05 | SET-2

5. A series RLC circuit with R = 3Ω, L = 1H and C = 0.5F, is excited by a unit step voltage. Obtain the expression for I(t) using Laplace Transform method. Assume that the circuit is initially relaxed. Sketch the variation of I(t) and state whether the circuit is over damped, or under damped or critically damped. [16]

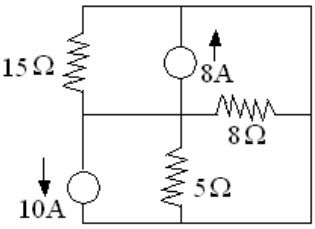
6.a) Define Hybrid parameters of a Two Port network. Establish the relation between Hybrid Parameters and ABCD Parameters.

b) Determine the Hybrid parameters for the Two Port network shown in figure.[8+8]



7.a) Explain clearly the following:
i) Active and Passive elements
ii) Linear and Non linear elements
iii) Unilateral and Bilateral elements.

b) Determine the voltage drop across the 8 ohms resistor in the circuit shown using Kirchoff's law. [6+10]



8.a) Clearly explain the following:
i) Self inductance (L)
ii) Mutual inductance (M)
iii) Dot convention.

b) An Iron ring of mean length 50 cms has an air gap of 1 mm and a winding of 200 Turns. If the relative permeability of the Iron is 400, when a current of 1 Amp flows in the winding, determine the flux density Neglect leakage and fringing.

c) State and explain Faraday's laws of electro magnetic induction. [6+6+4]

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Code.No: R05010203 | R05 | SET-3

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

Answer any FIVE questions
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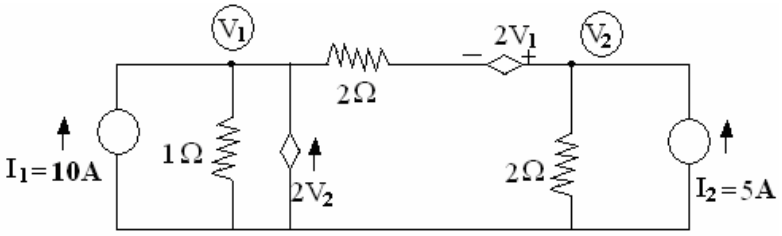
1.a) Find the values of V_1 and V_2 in the network shown using Nodal method of Analysis.



b) Define and explain the following with an example:
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2.a) State and explain Superposition Theorem.
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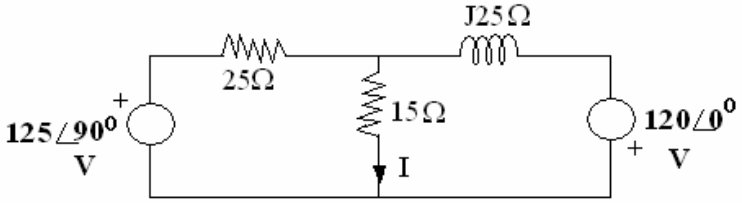

3. A series RLC circuit with R = 3Ω, L = 1H and C = 0.5F, is excited by a unit step voltage. Obtain the expression for I(t) using Laplace Transform method. Assume that the circuit is initially relaxed. Sketch the variation of I(t) and state whether the circuit is over damped, or under damped or critically damped. [16]

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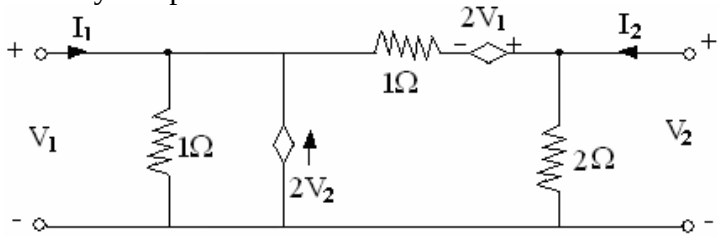

Code.No: R05010203 | R05 | SET-3

5.a) Explain clearly the following:
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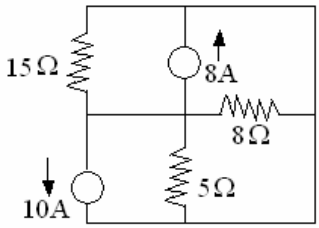
b) Determine the voltage drop across the 8 ohms resistor in the circuit shown using Kirchoff's law. [6+10]



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Code.No: R05010203 | R05 | SET-4

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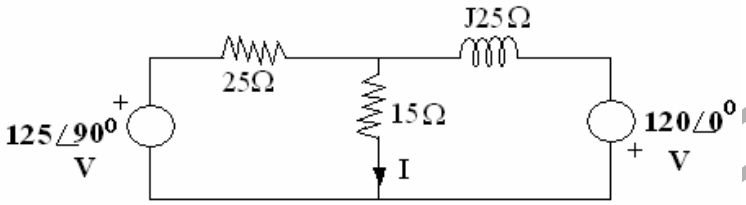
1.a) State and explain Superposition Theorem.
b) Determine the current I in the circuit shown using Superposition Theorem and Millman's Theorem. [4+12]



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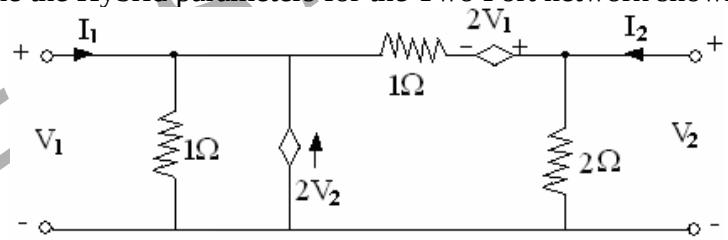

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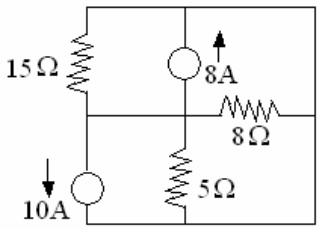

Code.No: R05010203 | R05 | SET-4

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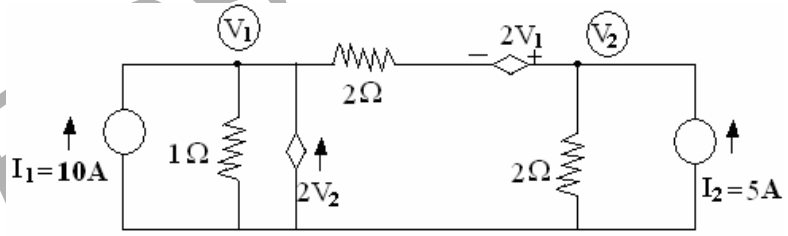

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