Code.No: R05010203 | R05 | SET-1

I B.TECH – EXAMINATIONS, JUNE - 2011
ELECTRICAL CIRCUITS
(ELECTRICAL AND ELECTRONIC ENGINEERING)

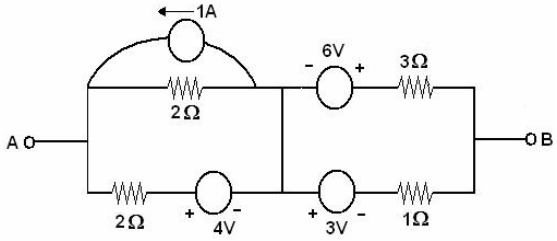
Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

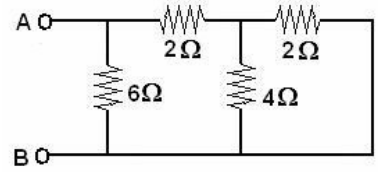
\- - -

1.a) State and explain the volt-ampere relationships for R, L, and C parameters.

b) Using the source Transformation, reduce the network between A and B into equivalent voltage source.



c) Determine the equivalent resistance between A and B of the network shown. [6+6+4]

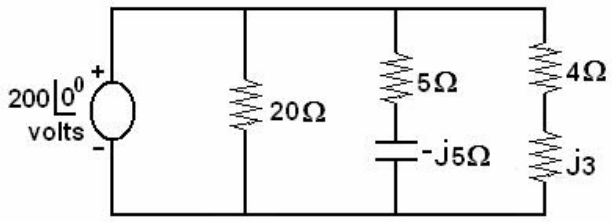


2.a) Distinguish between self and Mutual inductance. Also explain the significance of coefficient of coupling.

b) A magnetic circuit comprises three parts in series, each of uniform c.s. area. They are
Part (a) length of 100 mm and a c.s. area of 50 mm^2.
Part (b) length of 80 mm and a c.s. area of 100 mm^2.
Part (c) an air gap of lengths 0.4 mm and a c.s. area of 150 mm^2.
A coil of 2000 Turns is wound on Part (b) and the flux density in the air gap is 0.2 Tesla. Assuming that all the flux passes through the given circuit and that the relative permeability is 1200, find the current flowing through the coil to produce such a flux density. [6+10]

3.a) Define RMS value, Average value, Form factor of a periodic quantity. Specify these values for a sinusoidal alternating quantity having a peak value of V_m.

b) Determine the branch currents, total current and the power supplied by the source for the circuit shown in figure below. Also draw the Phasor diagram.

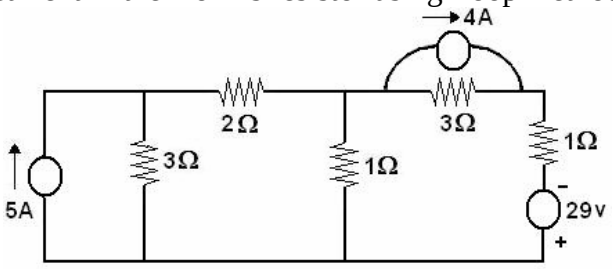


c) A series RLC circuit has a resonant frequency of 10^4 Hz. The value of inductance is 0.02 H. Calculate the value of capacitance. [6+6+4]

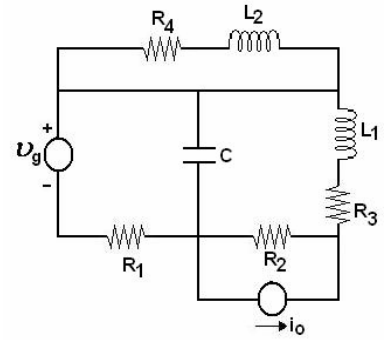
4.a) Show that the Line voltage = 1.732 times the phase voltage in a balanced star connected system.

b) A symmetrical 400 v, 3-phase, supplies a star connected load with $Z_R = 5\ \Omega$, $Z_Y = j5\ \Omega$ and $Z_B = -j5\ \Omega$. Determine the line currents the phase sequence is RYB. [6+10]

5.a) Determine the current in the 2 ohms resistor using Loop method of analysis.

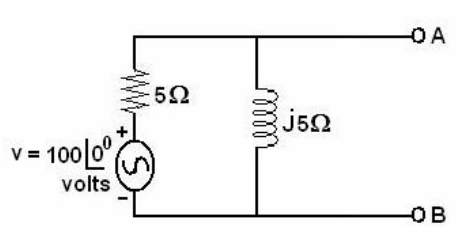


b) Explain the procedure for obtaining the dual of the given network. Obtain the dual of the network shown below. [8+8]



6.a) State and explain Reciprocity Theorem.

b) Obtain Thevinin's and Norton's Equivalent of the network shown w.r.t. terminals A and B.

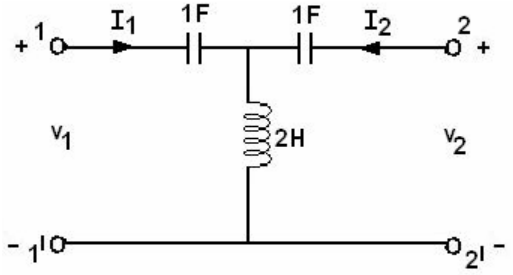


c) In the above network, determine the load impedance to be connected between A and B for maximum power transfer. [4+8+4]

7. A sinusoidal voltage of 12 Sin 8t volts is applied at t = 0 to a series circuit of R = 4Ω and L = 1H. By Laplace Transform Method, determine the current i(t) for all $t \geq 0$. Assume zero initial conditions. [16]

8.a) Define Transmission Parameters (ABCD) of a Two Port Network. Express open circuit impedance parameters (z-parameters) in terms of Transmission Parameters.

b) Find the ABCD parameters of the network shown in figure below using s-domain transformed network. [8+8]



* * * * * *

Code.No: R05010203 | R05 | SET-2

I B.TECH – EXAMINATIONS, JUNE - 2011
ELECTRICAL CIRCUITS
(ELECTRICAL AND ELECTRONIC ENGINEERING)

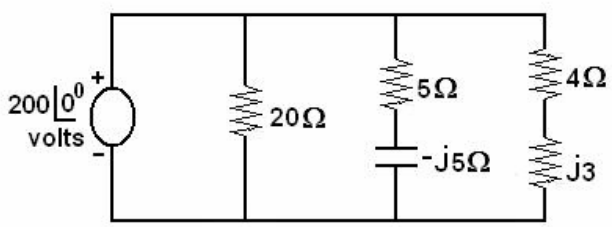
Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

\- - -

1.a) Define RMS value, Average value, Form factor of a periodic quantity. Specify these values for a sinusoidal alternating quantity having a peak value of V_m.

b) Determine the branch currents, total current and the power supplied by the source for the circuit shown in figure below. Also draw the Phasor diagram.

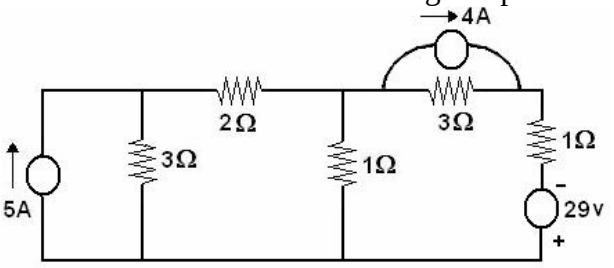


c) A series RLC circuit has a resonant frequency of 10^4 Hz. The value of inductance is 0.02 H. Calculate the value of capacitance. [6+6+4]

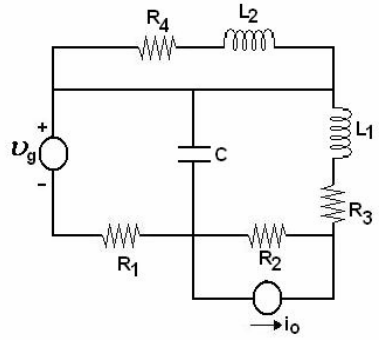
2.a) Show that the Line voltage = 1.732 times the phase voltage in a balanced star connected system.

b) A symmetrical 400 v, 3-phase, supplies a star connected load with $Z_R = 5\ \Omega$, $Z_Y = j5\ \Omega$ and $Z_B = -j5\ \Omega$. Determine the line currents the phase sequence is RYB. [6+10]

3.a) Determine the current in the 2 ohms resistor using Loop method of analysis.

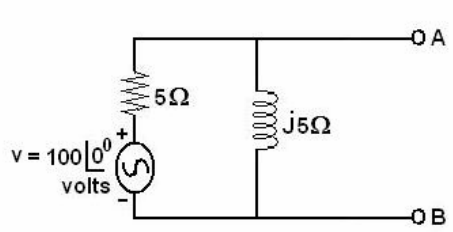


b) Explain the procedure for obtaining the dual of the given network. Obtain the dual of the network shown below. [8+8]



4.a) State and explain Reciprocity Theorem.

b) Obtain Thevinin's and Norton's Equivalent of the network shown w.r.t. terminals A and B.

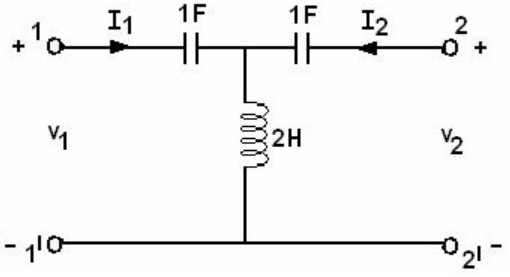


c) In the above network, determine the load impedance to be connected between A and B for maximum power transfer. [4+8+4]

5. A sinusoidal voltage of 12 Sin 8t volts is applied at t = 0 to a series circuit of R = 4Ω and L = 1H. By Laplace Transform Method, determine the current i(t) for all $t \geq 0$. Assume zero initial conditions. [16]

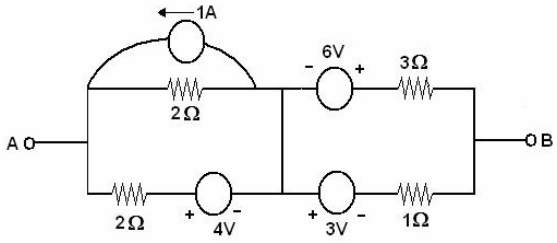
6.a) Define Transmission Parameters (ABCD) of a Two Port Network. Express open circuit impedance parameters (z-parameters) in terms of Transmission Parameters.

b) Find the ABCD parameters of the network shown in figure below using s-domain transformed network. [8+8]

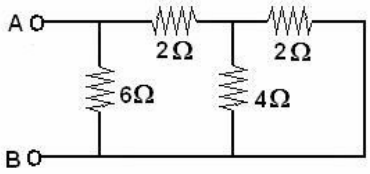


7.a) State and explain the volt-ampere relationships for R, L, and C parameters.

b) Using the source Transformation, reduce the network between A and B into equivalent voltage source.



c) Determine the equivalent resistance between A and B of the network shown. [6+6+4]



8.a) Distinguish between self and Mutual inductance. Also explain the significance of coefficient of coupling.

b) A magnetic circuit comprises three parts in series, each of uniform c.s. area. They are
Part (a) length of 100 mm and a c.s. area of 50 mm^2.
Part (b) length of 80 mm and a c.s. area of 100 mm^2.
Part (c) an air gap of lengths 0.4 mm and a c.s. area of 150 mm^2.
A coil of 2000 Turns is wound on Part (b) and the flux density in the air gap is 0.2 Tesla. Assuming that all the flux passes through the given circuit and that the relative permeability is 1200, find the current flowing through the coil to produce such a flux density. [6+10]

* * * * * *

Code.No: R05010203 | R05 | SET-3

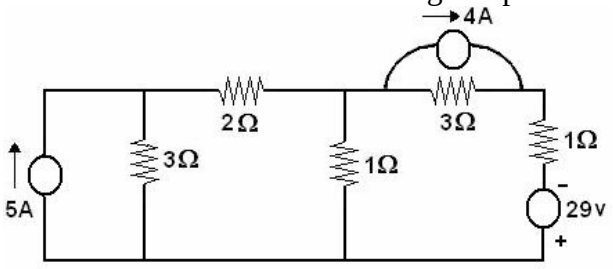
I B.TECH – EXAMINATIONS, JUNE - 2011
ELECTRICAL CIRCUITS
(ELECTRICAL AND ELECTRONIC ENGINEERING)

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

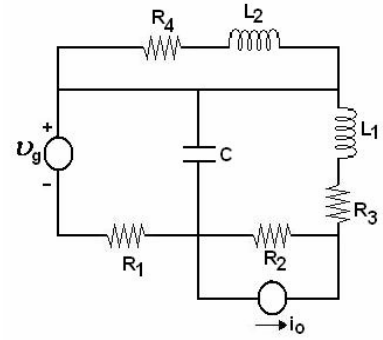
Answer any FIVE questions
All questions carry equal marks

\- - -

1.a) Determine the current in the 2 ohms resistor using Loop method of analysis.

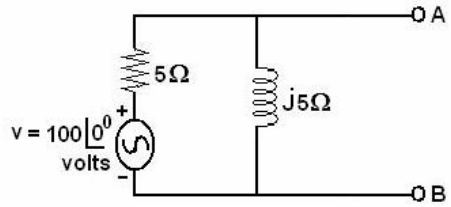


b) Explain the procedure for obtaining the dual of the given network. Obtain the dual of the network shown below. [8+8]



2.a) State and explain Reciprocity Theorem.

b) Obtain Thevinin's and Norton's Equivalent of the network shown w.r.t. terminals A and B.

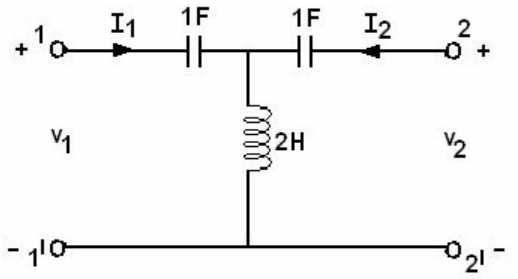


c) In the above network, determine the load impedance to be connected between A and B for maximum power transfer. [4+8+4]

3. A sinusoidal voltage of 12 Sin 8t volts is applied at t = 0 to a series circuit of R = 4Ω and L = 1H. By Laplace Transform Method, determine the current i(t) for all $t \geq 0$. Assume zero initial conditions. [16]

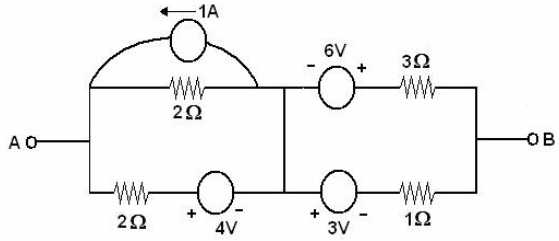
4.a) Define Transmission Parameters (ABCD) of a Two Port Network. Express open circuit impedance parameters (z-parameters) in terms of Transmission Parameters.

b) Find the ABCD parameters of the network shown in figure below using s-domain transformed network. [8+8]

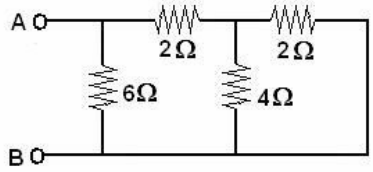


5.a) State and explain the volt-ampere relationships for R, L, and C parameters.

b) Using the source Transformation, reduce the network between A and B into equivalent voltage source.



c) Determine the equivalent resistance between A and B of the network shown. [6+6+4]

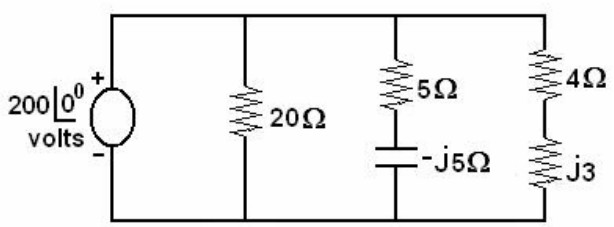


6.a) Distinguish between self and Mutual inductance. Also explain the significance of coefficient of coupling.

b) A magnetic circuit comprises three parts in series, each of uniform c.s. area. They are
Part (a) length of 100 mm and a c.s. area of 50 mm^2.
Part (b) length of 80 mm and a c.s. area of 100 mm^2.
Part (c) an air gap of lengths 0.4 mm and a c.s. area of 150 mm^2.
A coil of 2000 Turns is wound on Part (b) and the flux density in the air gap is 0.2 Tesla. Assuming that all the flux passes through the given circuit and that the relative permeability is 1200, find the current flowing through the coil to produce such a flux density. [6+10]

7.a) Define RMS value, Average value, Form factor of a periodic quantity. Specify these values for a sinusoidal alternating quantity having a peak value of V_m.

b) Determine the branch currents, total current and the power supplied by the source for the circuit shown in figure below. Also draw the Phasor diagram.



c) A series RLC circuit has a resonant frequency of 10^4 Hz. The value of inductance is 0.02 H. Calculate the value of capacitance. [6+6+4]

8.a) Show that the Line voltage = 1.732 times the phase voltage in a balanced star connected system.

b) A symmetrical 400 v, 3-phase, supplies a star connected load with $Z_R = 5\ \Omega$, $Z_Y = j5\ \Omega$ and $Z_B = -j5\ \Omega$. Determine the line currents the phase sequence is RYB. [6+10]

* * * * * *

Code.No: R05010203 | R05 | SET-4

I B.TECH – EXAMINATIONS, JUNE - 2011
ELECTRICAL CIRCUITS
(ELECTRICAL AND ELECTRONIC ENGINEERING)

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

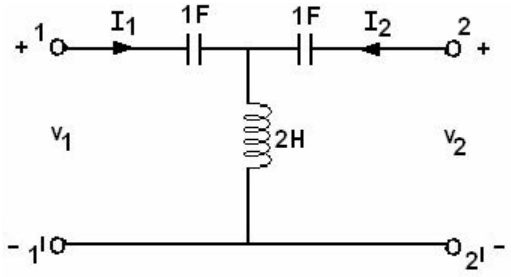
Answer any FIVE questions
All questions carry equal marks

\- - -

1. A sinusoidal voltage of 12 Sin 8t volts is applied at t = 0 to a series circuit of R = 4Ω and L = 1H. By Laplace Transform Method, determine the current i(t) for all t ≥ 0. Assume zero initial conditions. [16]

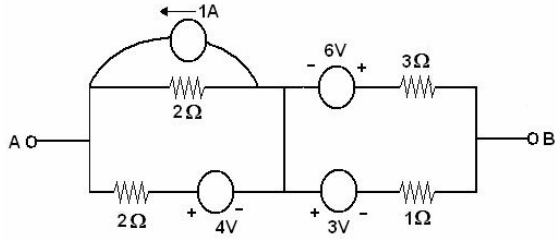
2.a) Define Transmission Parameters (ABCD) of a Two Port Network. Express open circuit impedance parameters (z-parameters) in terms of Transmission Parameters.

b) Find the ABCD parameters of the network shown in figure below using s-domain transformed network. [8+8]



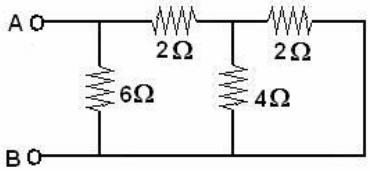
3.a) State and explain the volt-ampere relationships for R, L, and C parameters.

b) Using the source Transformation, reduce the network between A and B into equivalent voltage source.



c) Determine the equivalent resistance between A and B of the network shown.

[6+6+4]



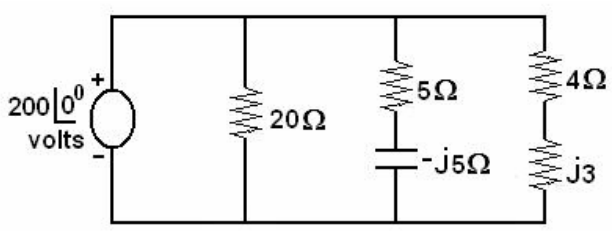
4.a) Distinguish between self and Mutual inductance. Also explain the significance of coefficient of coupling.

b) A magnetic circuit comprises three parts in series, each of uniform c.s. area. They are
Part (a) length of 100 mm and a c.s. area of 50 mm^2.
Part (b) length of 80 mm and a c.s. area of 100 mm^2.

Part (c) an air gap of lengths 0.4 mm and a c.s. area of 150 mm^2.
A coil of 2000 Turns is wound on Part (b) and the flux density in the air gap is 0.2 Tesla. Assuming that all the flux passes through the given circuit and that the relative permeability is 1200, find the current flowing through the coil to produce such a flux density. [6+10]

5.a) Define RMS value, Average value, Form factor of a periodic quantity. Specify these values for a sinusoidal alternating quantity having a peak value of V_m.

b) Determine the branch currents, total current and the power supplied by the source for the circuit shown in figure below. Also draw the Phasor diagram.

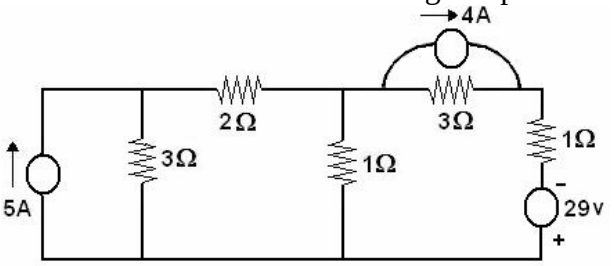


c) A series RLC circuit has a resonant frequency of 10^4 Hz. The value of inductance is 0.02 H. Calculate the value of capacitance. [6+6+4]

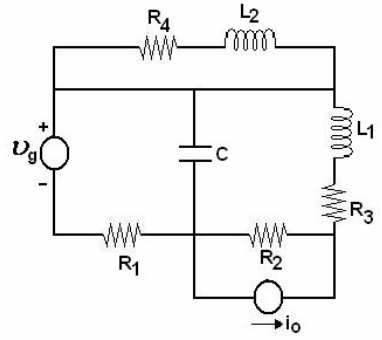
6.a) Show that the Line voltage = 1.732 times the phase voltage in a balanced star connected system.

b) A symmetrical 400 v, 3-phase, supplies a star connected load with $Z_R = 5\ \Omega$, $Z_Y = j5\ \Omega$ and $Z_B = -j5\ \Omega$. Determine the line currents the phase sequence is RYB. [6+10]

7.a) Determine the current in the 2 ohms resistor using Loop method of analysis.

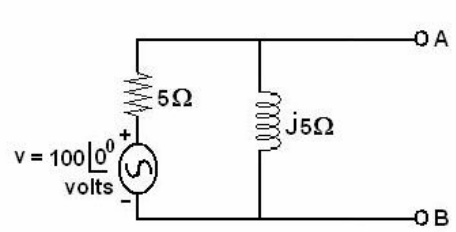


b) Explain the procedure for obtaining the dual of the given network. Obtain the dual of the network shown below. [8+8]



8.a) State and explain Reciprocity Theorem.

b) Obtain Thevinin's and Norton's Equivalent of the network shown w.r.t. terminals A and B.



c) In the above network, determine the load impedance to be connected between A and B for maximum power transfer. [4+8+4]

* * * * * *