B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2013

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGG

Semester II

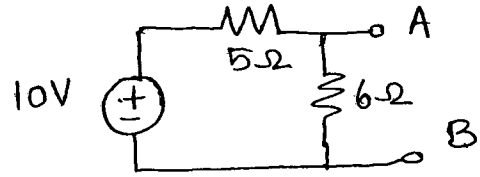
EE8201 & Electric Circuits Analysis

(R-2013)

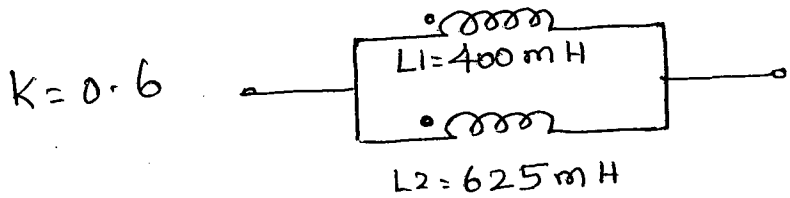
Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

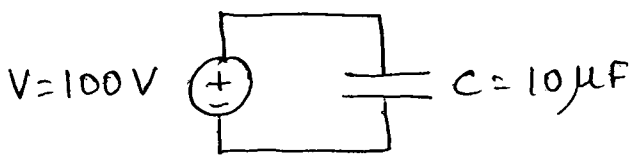
1. Derive current division rule and voltage division rule
2. Find the thevenin's equivalent across terminal A and B for the circuit given below.



3. Determine the equivalent inductance of the parallel combination of L1 and L2 as shown in figure below.



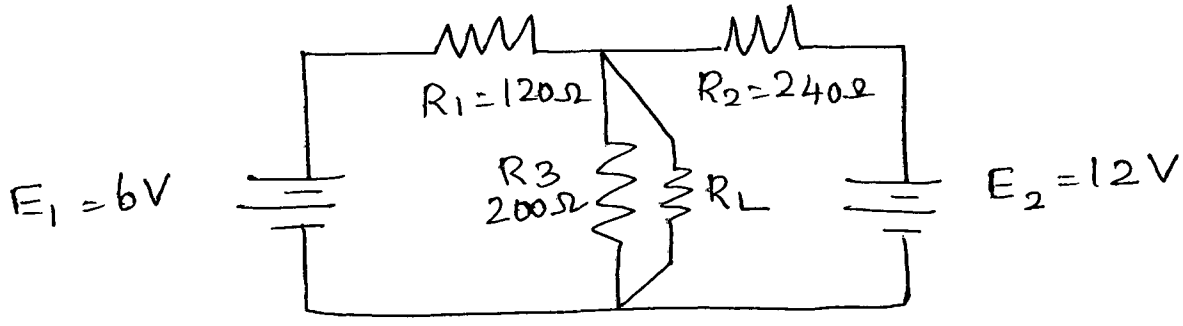
4. Distinguish single tuned and double tuned circuits
5. A inductor and capacitor are connected in series and supplied 220 V at 50 Hz. The maximum current obtainable by varying inductance is 0.36 A. Voltage across capacitor is 330 V. Find L.
6. Define time constant of series RC circuit .
7. List the procedure for computing the initial conditions for performing time domain analysis of an electric given circuit.
8. The line to line voltage of a delta connected primary of a transformer is 220 V. Compute the phase voltage and the phase current if the line current drawn from primary side is 10A
9. For the given circuit draw the equivalent of capacitor at time t=∞.



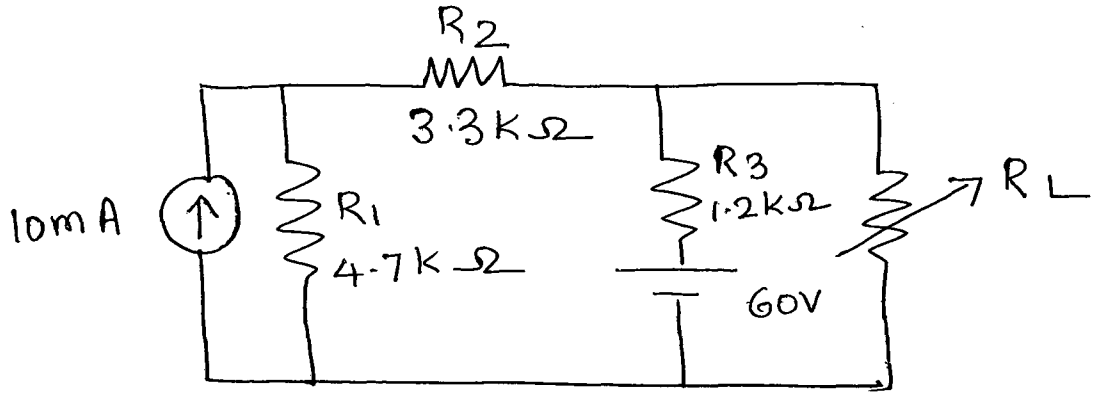
10. Define h parameters

PART B (5*16=80 marks)

11 a) Determne the thevenin's equivalent circuit for the network to calculate the load current when R_L =330 ohms. (8)



11 b) Using superposition theorem calculate the output voltage for R_L =5.6 KΩ. (8)



12 a) A series RLC circuit has R=5 ohms, L=40 mH and C=1 μF. Calculate Q of the circuit, resonant frequency, half power frequency f_1 and f_2 and separation between half power frequencies. (8)

b) Derive an expression for Q factor in terms of circuit parameters. (4)

c) Draw the following frequency response curves for a series R L circuit. (4)

i) Variation of current and impedance ii) Variation of voltage across R

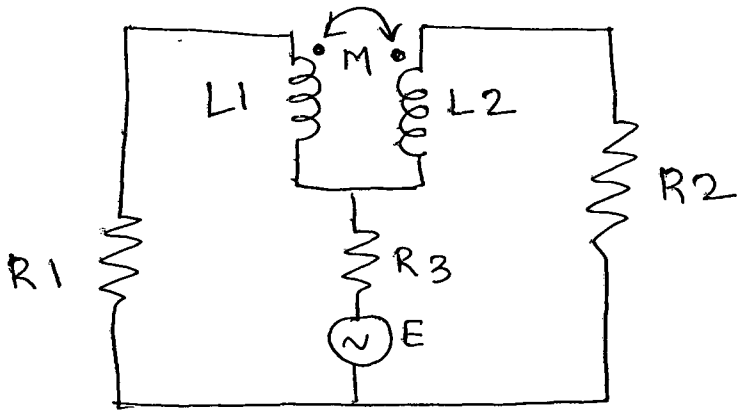
iii)Variation of voltage across L iv)Variation of voltage across C

(OR)

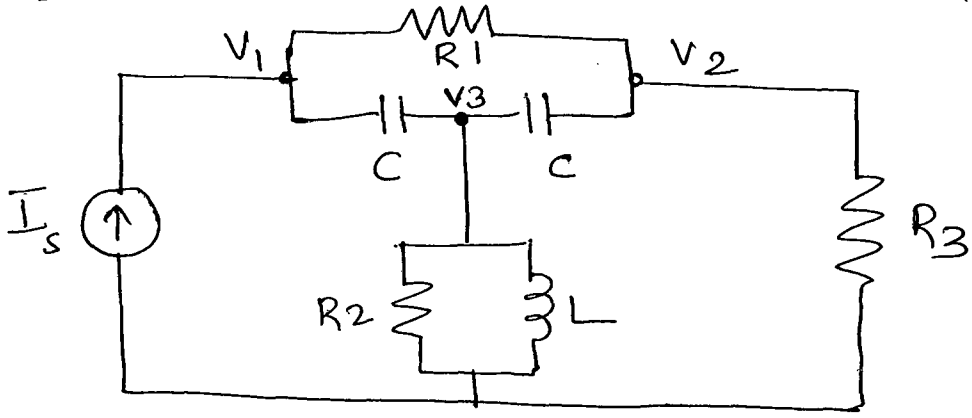
12 b) For the circuit given obtain i) equivalent conductively coupled circuit. (6)

ii) Mesh equations in instantaneous domain. (5)

iii) Mesh equations in frequency domain. (5)



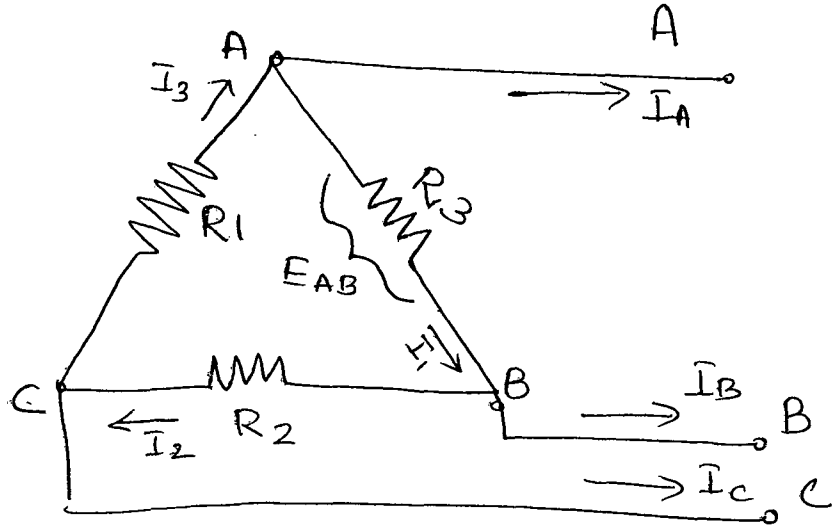
13) a) For the circuit shown in the figure write down the nodel equations. Derive the condition for $V_2=0$. (16)



(OR)

13 b) i) Using phasor diagrams deduce the relationship between line voltage and phase voltage and line current and phase current for a Y connected three phase generator (8)

ii) The circuit given below has R1=R2=R3=200 Ω, and V_{phase}=100 V. Calculate the load currents and the line currents.



14.a) In the network shown in the Figure A , assume initially relaxed condition and find the currents i_1 and i_2 in the two meshes, by Laplace transformation method. The switch S is closed at t = 0 sec. (16)

14.b) i) In the RC network shown in the Figure B , assume initially relaxed condition and find how long it takes after the switch S is closed before the total current from the supply reaches 30 mA. Given V_1=10 V, R_1=500 ohm, R_2=700 ohm and C=100 μF. (12)

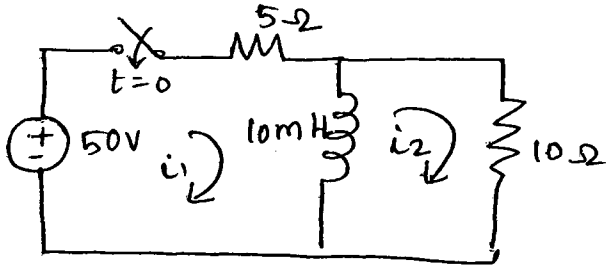


Fig A

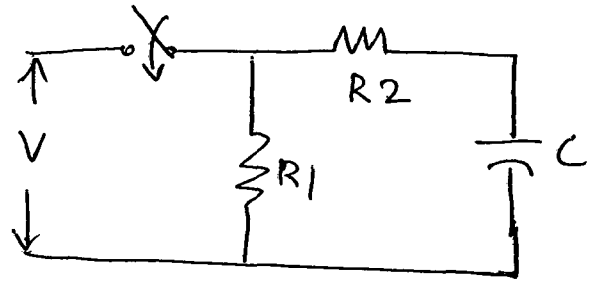
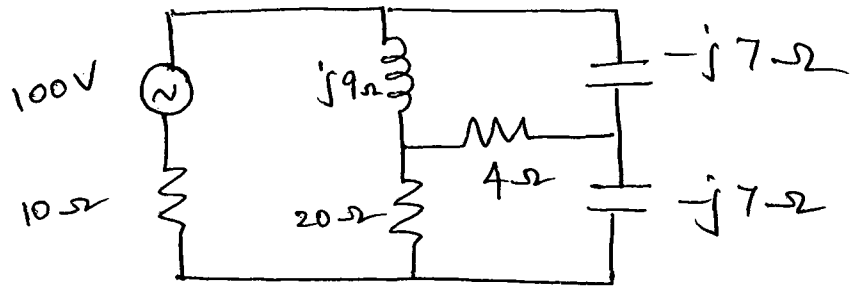


Fig B

ii)State what would be the response of a circuit when a circuit is excited at pole frequency and at zero frequency. Justify using ideal capacitor and inductor. (4)

15.a) i) Find the driving point impedance and transfer impedance Z_{11}, Z_{12}, Z_{13} for the circuit given below. (8)

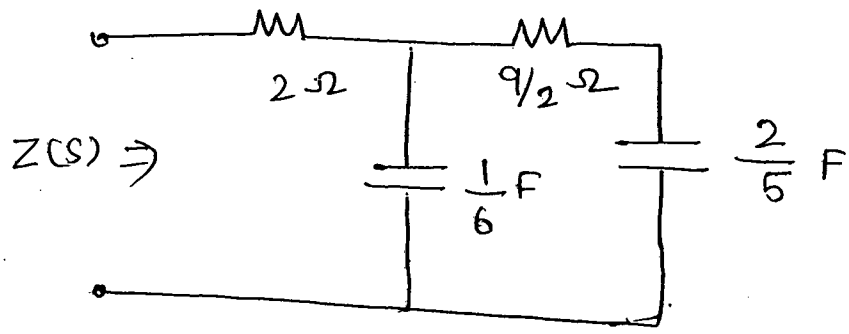


ii) Prove that for any transmission network AD-BC =1. (8)

(OR)

15.b) i)Compute open circuit input impedance for the two port network shown. (12)

ii)Also sketch the pole zero pattern of the impedance fuction derved in the above section (4)



END OF PAPER