Code: R7100406

R07

B.Tech I Year (R07) Supplementary Examinations January/February 2014

NETWORK ANALYSIS

(Common to ECE, EIE, E.Con.E & ECC)

Time: 3 hours Max. Marks: 80

Answer any FIVE questions

All questions carry equal marks

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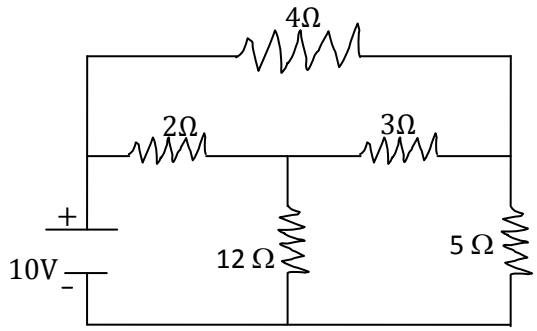
1 (a) Three resistances R_{ab}, R_{bc} and R_{ca} are connected in delta connection, derive the expressions for equivalent star connection.

(b) Find the current supplied by 10 V battery by using star-delta transformation for the following network.



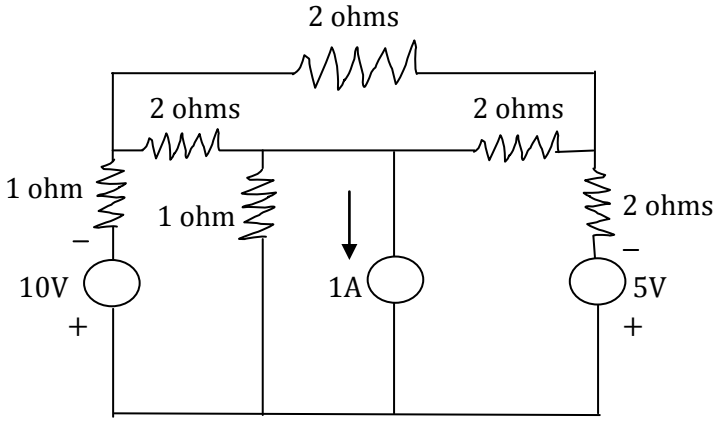
2 (a) Derive the expression for RMS value of alternating current wave $I = I_m$ Sin ωt.

(b) A coil takes a current of 1 A at 0.6 lagging power factor from a 220 V, 60 Hz single phase source. If the coil is modeled by a series RL circuit find (i) The complex power in the coil and (ii) The values of R and L.

3 (a) Derive the relation between phase and line values in three phase star connected balanced system.

(b) Given a series RLC circuit with R = 100 ohms, L = 0.5 H and C = 40 μF, calculate the resonant, lower and upper half – power frequencies.

4 For the below network draw the graph and write down the procedure to obtain cut set matrix.



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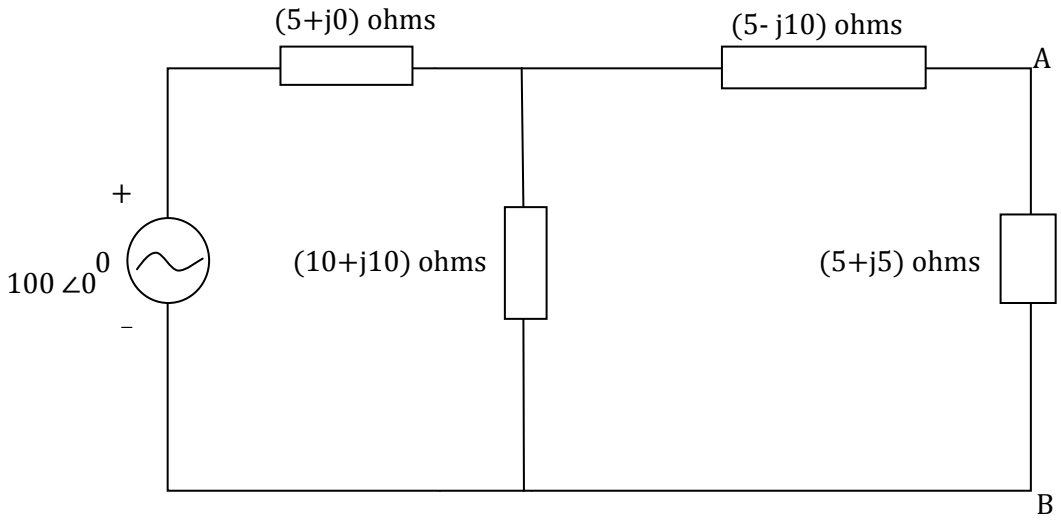
5 (a) State and explain Milleman's theorem for AC network by taking any one example.

(b) By using Norton's theorem find the current flowing through (5+j5) ohms impedance



6 (a) Derive the relation between Z and Y parameters in a two port network.

(b) Define and explain ABCD-parameters of a two port network.

7 (a) Derive the expression for i(t), when series RLC circuit excited by DC voltage 'V' when the switch is closed at t = 0.

(b) In a series RLC circuit R = 5 ohms, L = 1 H, C = 1 F. A DC voltage of 20 V is applied at t = 0. Obtain i(t).

8 (a) Write short notes on m-derived high pass filter.

(b) Design m-derived high pass filter, given nominal impedance = 600 ohms, m = 0.45 and cut of frequency = 10 KHz.

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