Code: R7100406

R07

B.Tech I Year (R07) Supplementary Examinations December/January 2015/2016

NETWORK ANALYSIS

(Common to ECEM EIE, E.Con.E, ECC & CSS)

(For 2008 regular admitted batch only)

Time: 3 hours Max. Marks: 80

Answer any FIVE questions

All questions carry equal marks

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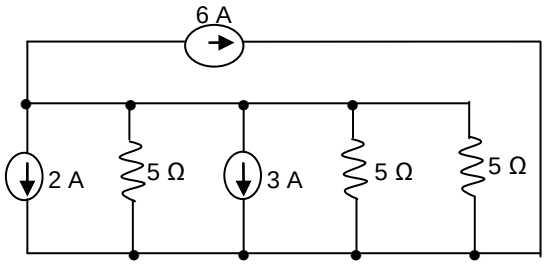
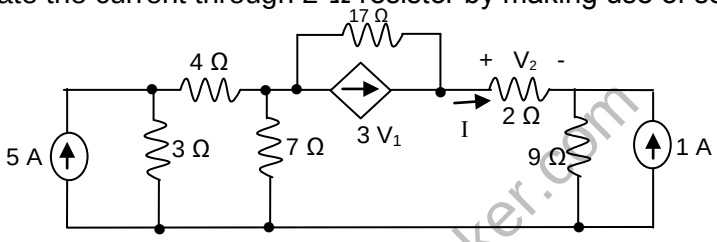
1 (a) If R_1, R_2, R_3 are resistances of different branches of a star connected network. Find the equivalent branch resistances of the above network when converted into a delta network.

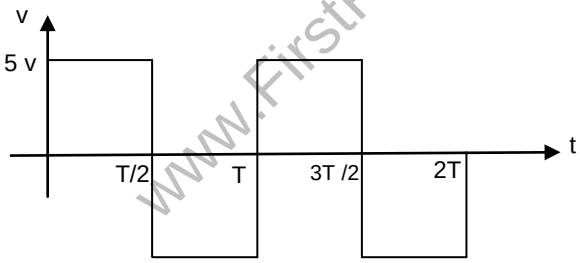
(b) (i) Compute the power supplied by each source in the given circuit.



(ii) Calculate the current through 2 Ω resistor by making use of source transformation.

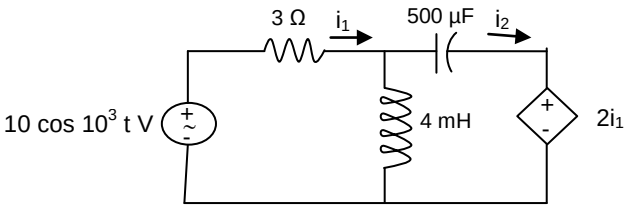


2 (a) (i) Find average, RMS and form factor for the following wave form.



(ii) If L_1, L_2 are self inductance of two inductors. Let M be the mutual inductance of the coils and K be the coefficient of coupling between them. Derive the relation between L_1, L_2 and M when these two coils are magnetically coupled.

(b) Obtain expression for the time-domain currents i_1 and i_2 in the given circuit.



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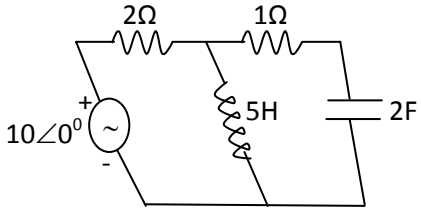
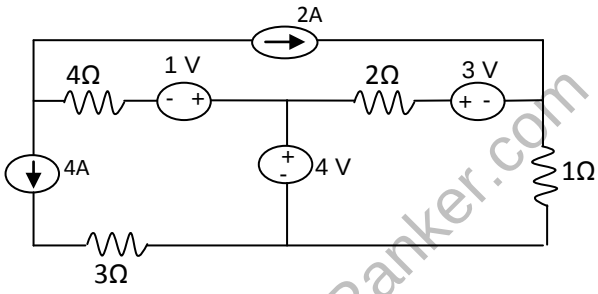
3 (a) (i) A series RLC resonant circuit composed of a 10 Ω resistance a 200 nF capacitance, and a 2-mH inductance. Calculate resonant frequency in radians, band width and also quality factor.
(ii) A balanced three-phase three wire system has a star connected load. Each phase contain three loads in parallel they are –j100 Ω, 100 Ω and 50+j50 Ω. Assume positive phase sequence V_{ab} = 400 V. Find the total power drawn by the load.
(b) In three-phase Y-Y connection derive the relationship between line and phase voltage and current with necessary phasor diagram.

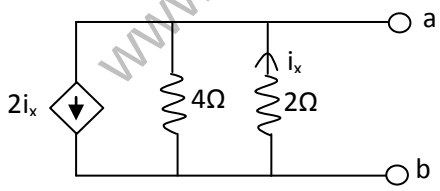
4 (a) (i) Find the dual network for the given circuit.



(ii) Explain the concept of cutest matrix with the help of simple planar network.
(b) Determine the power supplied by 2A source in the circuit using nodal analysis



5 (a) State and explain superposition theorem.
(b) State and explain millimans theorem.
(c) Find the thevinens equivalent for the given circuit.



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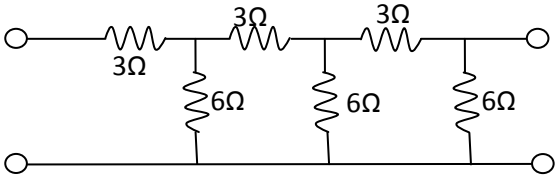
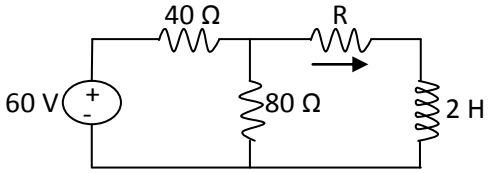
6 (a) Determine the ABCD parameters for the given circuit.



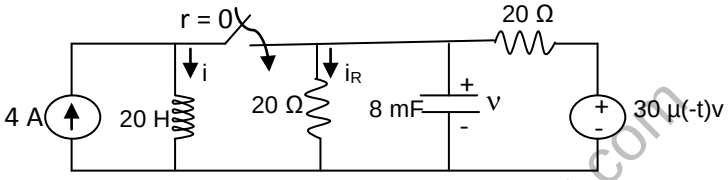
(b) Derive the following relation of interconnected networks.

$[Y] = [Y_a] + [Y_b]$

7 (a) For the given circuit find the value of R for which energy stored in inductor will be 1J.



(b) In the circuit find the expressions for i(t) and iR(t) for t>0.



8 (a) Compare LP, HP, BP filter characteristics.

(b) A filter section is required to have nominal impedance of 600Ω, a cut -off frequency of 5 KHz and frequency of infinite attenuation at 5.50 kHz. Design an appropriate m-derived T-section.

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