

Code: R7100206

B.Tech I Year (R07) Supplementary Examinations, June 2013

**ELECTRICAL CIRCUIT ANALYSIS**

(Electrical and Electronics Engineering)

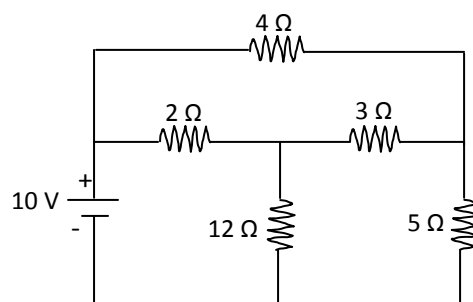
Time: 3 hours

Max Marks: 80

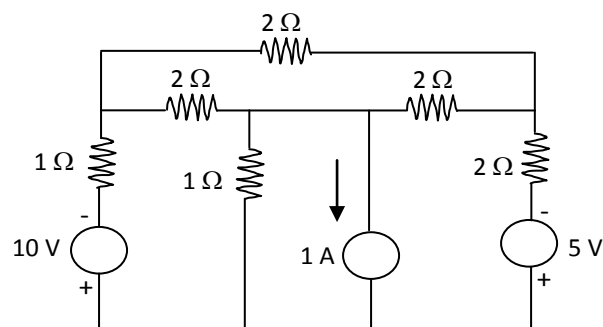
Answer any FIVE questions  
All questions carry equal marks

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- Define and explain resistance, inductance and capacitance parameters.
  - Find the current in the 12 ohms resistor by using star-delta transformation.



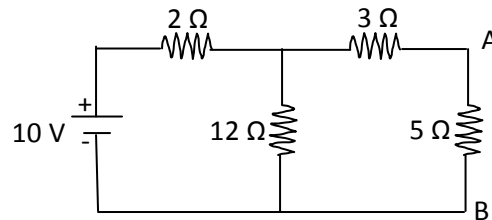
- What is an electric circuit? What is a magnetic circuit? Make a comparison between electric circuit and magnetic circuit.
  - Coil 1 of a pair of coupled coils has a continuous current of 5 A and the corresponding fluxes  $\phi_{11}$  and  $\phi_{12}$  are 0.2 and 0.4 m Wb respectively, if the turns are  $N_1 = 500$  and  $N_2 = 1500$ , find  $L_1$ ,  $L_2$ ,  $M$  and  $k$ .
- Obtain the current locus of a series circuit having a fixed resistance and a variable inductance.
  - Given a series RLC circuit with  $R = 100$  ohms,  $L = 0.5$  H and  $C = 40 \mu\text{F}$ , calculate the resonant, lower and upper half – power frequencies.
- Derive the relation between phase and line values in a three phase star connected balanced system.
  - Three impedances each of  $(5-j3)$  ohms are connected in delta to a 230 V, 3-phase, 50 Hz balanced supply. Calculate the line and phase currents and power delivered to the load.
- Obtain the node voltages for the following network shown in figure.



Contd. in page 2

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6. (a) State and explain Millmans theorem.  
 (b) By using Thevenin's theorem determine the current through  $5\ \Omega$  resistor (All resistances are in  $\Omega$ ) as shown in figure.



7. (a) Derive the expression for  $i(t)$ , when series RL circuit excited by DC voltage 'V' when the switch is closed at  $t = 0$ .  
 (b) In a series RLC circuit  $R = 5\ \text{ohms}$ ,  $L = 1\ \text{mH}$ ,  $C = 1\ \mu\text{F}$ . A DC voltage of  $20\ \text{V}$  is applied at  $t = 0$ . Obtain  $i(t)$ .
8. (a) Derive the relation between hybrid and transmission parameters in a two port network.  
 (b) Define and explain open circuit parameters by taking any one example of a two port network.

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