

Code No: R21023

R10
SET - 1
II B. Tech I Semester Supplementary Examinations, May/June - 2017
ELECTRICAL CIRCUIT ANALYSIS - I

(Electrical and Electronics Engineering)

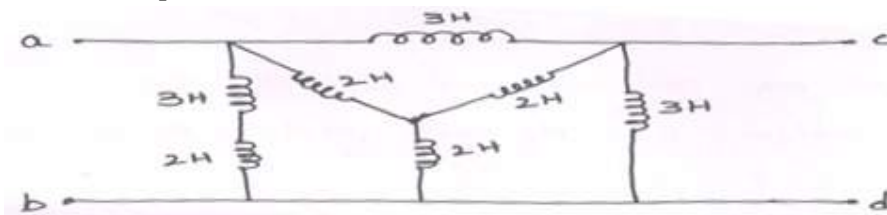
Time: 3 hours

Max. Marks: 75

 Answer any **FIVE** Questions
 All Questions carry **Equal** Marks
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1. a) What do you mean by capacitance parameter, and explain its significance in circuits. (8M)
- b) The voltage across an inductor is given by (7M)  
 $V(t) = 0$ , for  $t \leq 0$ ;  $v(t) = 20 t e^{-2t}$ , for  $t \geq 0$   
 Obtain the expression for current in the inductor and its value at  $t = 3\text{msec}$

2. Obtain the equivalent inductance at terminal "a – b" for the circuit shown below:- (15M)



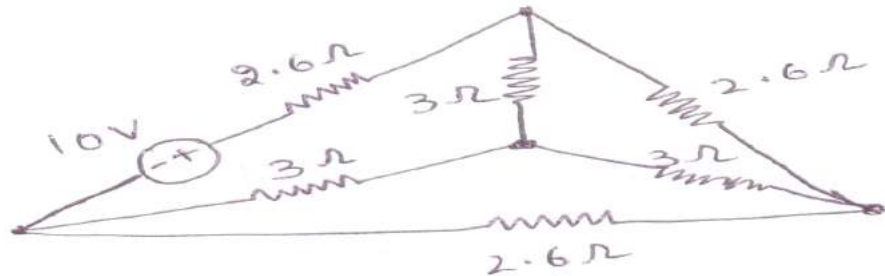
3. a) Explain the response of series RL circuit for a sinusoidal current source and also draw its complex impedance triangle. (7M)
- b) A wire carries a current of which is the combination of a direct current of 10 A and a sinusoidal current with a peak value of 10 A. Determine the RMS value of the resultant. (8M)
4. a) Explain the phenomenon of resonance and give its significance (7M)
- b) A coil produces resonance at 20 KHz in series with a capacitor. Assuming the inductance and resistance of the coil be 10 H and  $100\Omega$ , find the Q factor of the coil. (8M)
5. a) Explain the concept of dot convention in coupled coils (7M)
- b) Two coupled coils have self inductances  $L_1 = 16 \times 10^{-3} \text{ H}$  and  $L_2 = 28 \times 10^{-3} \text{ H}$ . The coefficient of coupling being 0.76 in the air, find voltage in the second coil and the flux of first coil provided the second coil has 490 turns and the circuit current is given by  $i_1 = 3\sin 314t \text{ A}$ . (8M)

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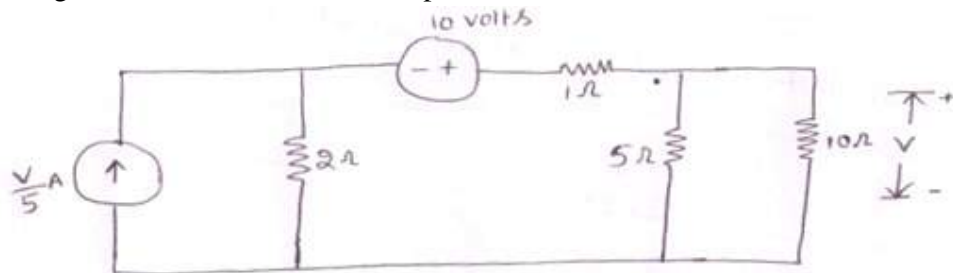
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6. a) Explain the procedure of obtaining fundamental Tie-set matrix (or) Fundamental loop matrix (7M)  
b) Determine the fundamental loop matrix for the network shown below (8M)



7. a) State and explain maximum power transfer theorem (7M)  
b) Using thevenin's theorem, find the power loss in 10 ohm resistor (8M)



8. Find 'I' using Norton's theorem (15M)

