



C14-EC-403

4457

**BOARD DIPLOMA EXAMINATION, (C-14)**  
**OCT/NOV—2016**  
**DECE—FOURTH SEMESTER EXAMINATION**  
**NETWORK ANALYSIS**

Time : 3 hours ]

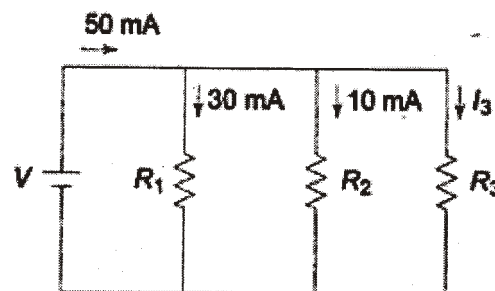
[ Total Marks : 80

**PART—A**

3×10=30

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

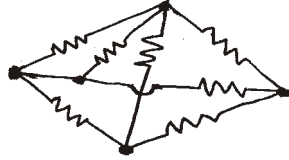
1. Define active and passive elements.
2. Determine the current through resistance  $R_3$ .



3. State superposition theorem.
4. State maximum power transfer theorem for DC circuits.

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5. Determine the number of mesh current equations required for the network shown below.



6. Explain duality of a network.
7. Define steady state and transient response.
8. Define the conditions for symmetry and reciprocity in terms of  $h$ -parameters.
9. Draw the circuit of constant resistance equalizer.
10. Define terms Neper and Decibel.

**PART—B**

10×5=50

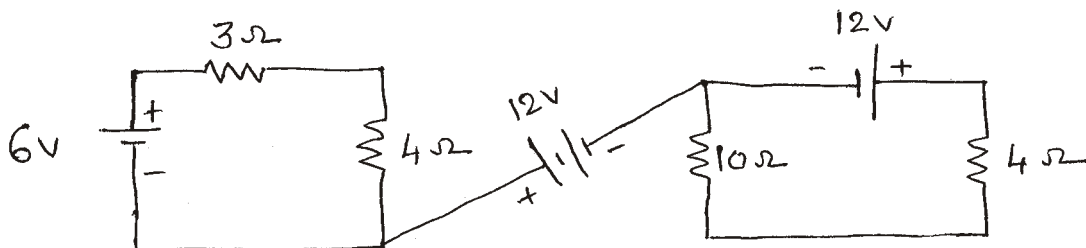
**Instructions :** (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

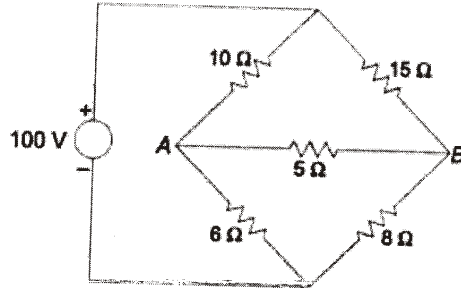
11. (a) Explain the dot rule for coupled circuits. 4

- (b) Find the voltage across  $A$  and  $B$  in the circuit shown in figure below : 6

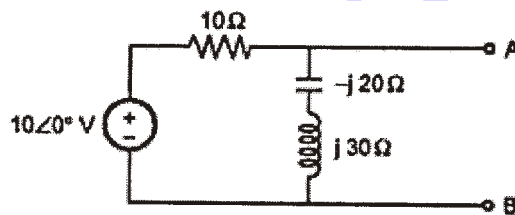


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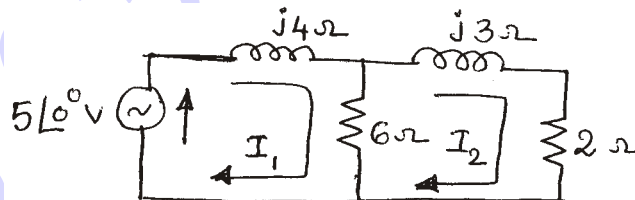
- \* 12. Use Thevenin's theorem to find current through 5 ohm resistor in the circuit shown below :



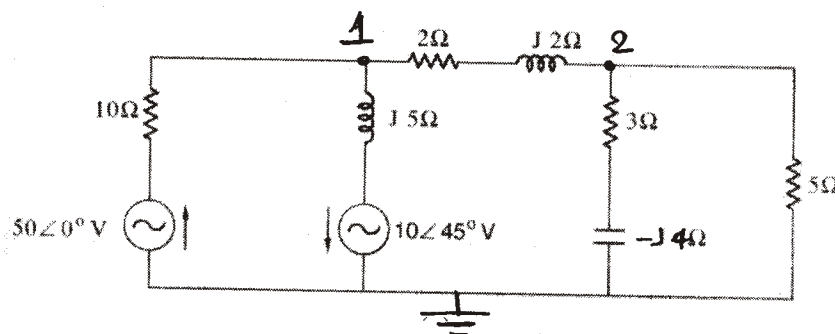
13. Find the load impedance required to be connected across the terminals A-B for the maximum power transfer, in the network shown in the figure below. Also find the maximum power delivered to the load :



14. Write the mesh current equations for the given circuit and determine the currents  $I_1$  and  $I_2$  :

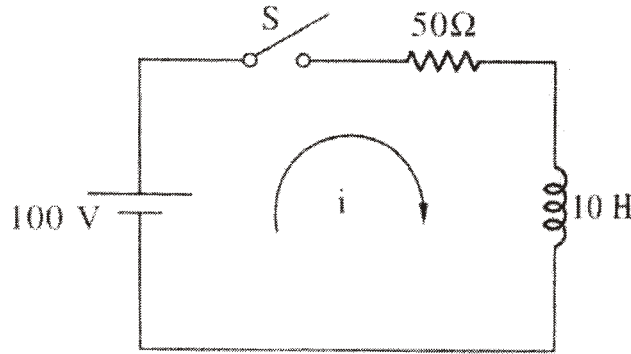


15. In the given network find the voltage at node 1 using node voltage method :

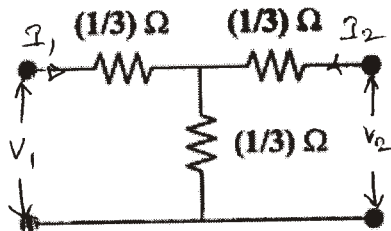


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16. A series  $RL$  circuit with  $R = 50 \Omega$  and  $L = 10 H$  has a constant voltage  $v = 100$  volts applied at  $t = 0$  by closing a switch. Find (a) the equations for  $i$ ,  $V_R$  and  $V_L$  and (b) the current at  $t = 0.5$  second.



17. Derive the expression for characteristic impedance of symmetrical  $T$ -network.
18. Determine  $Y$ -parameters for the following network :



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