



C16-EC-305

6236

BOARD DIPLOMA EXAMINATION, (C-16)

JUNE/JULY—2022

DECE – THIRD 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. State Ohm's law and mention its limitations.
2. Define ideal voltage source and ideal current source.
3. Define terms node, junction and loop.
4. What is duality of a network?
5. State superposition theorem.
6. State maximum power transfer theorem.
7. Define the terms steady state and transient state.
8. State inverse Laplace transform.
9. Define the term characteristic impedance and propagation constant.
10. List the disadvantages of constant  $K$  filters.

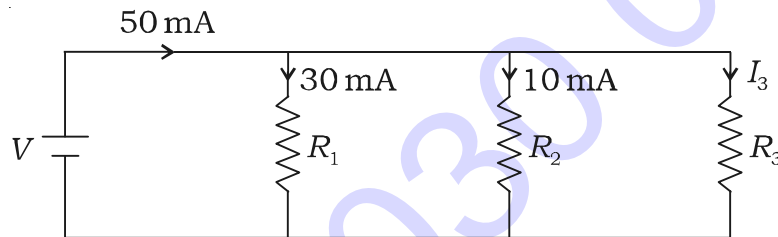
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**PART—B**

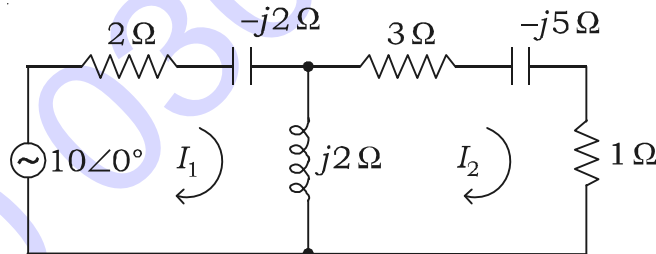
10×5=50

- Instructions :** (1) Answer *any five* questions.  
 (2) Each question carries **ten** marks.  
 (3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

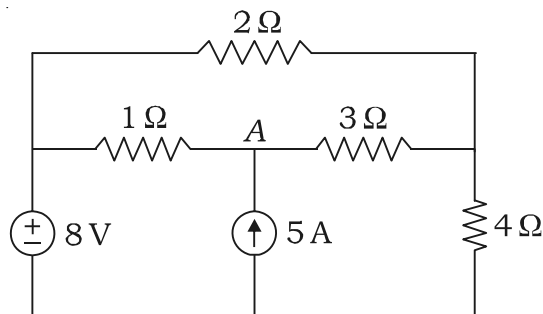
- 11.** (a) State Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL).  
 (b) Determine the current  $I_3$  in the circuit using Kirchhoff's Current Law (KCL).



- 12.** Find the mesh currents in the following network using mesh current analysis.

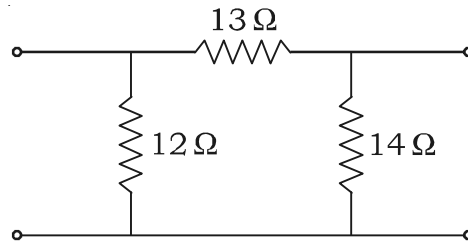


- 13.** Find the voltage at node A using node voltage analysis.

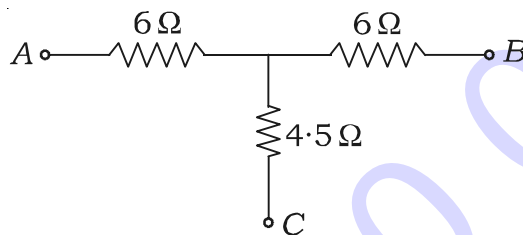


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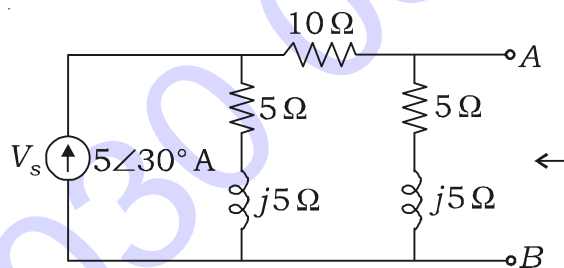
14. (a) Obtain the star-connected equivalent for the delta-connected network shown in the figure.



- (b) Convert the following star network into delta network.



15. Find the voltage across  $AB$  using Norton's theorem.



16. A series  $R$ - $C$  circuit with  $R = 5000$  ohm and  $C = 20$  microfarad has a constant voltage  $V = 100$  V applied at  $t = 0$  second and the capacitor has no initial charge. Find the equations for  $V_R(t)$ ,  $i(t)$  and  $V_C(t)$ .

17. Briefly explain (a) Linear property, (b) First shifting property and (c) Change of scale property of Laplace transform.

- \* 18. Define LPF, HPF, BPF and BSF. Also draw the characteristic curves for these filters.

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