



C16-EC-305

6236

BOARD DIPLOMA EXAMINATION, (C-16)
JANUARY/FEBRUARY—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.
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1. Define active and passive elements.
 2. State Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL).
 3. Define (a) Junction, (b) Branch and (c) Loop.
 4. What is the dual of (a) Voltage Source, (b) Open Circuit and (c) Node.
 5. Write the transformation formulae for Star to Delta and Delta to Star.
 6. State Reciprocity theorem.
 7. Define the terms Initial Condition and Transient Condition.
 8. Write Laplace transforms of Unit Step function, Exponential function and Sine function.

9. Define the terms Neper and Decibel.

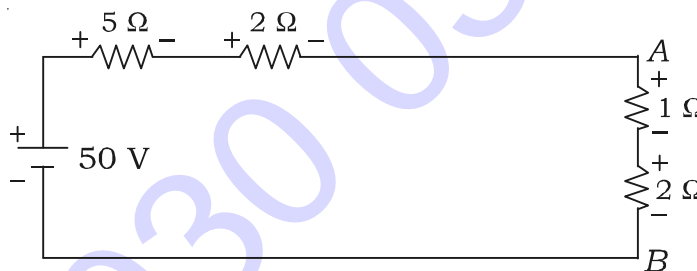
10. List different types of attenuators.

PART—B

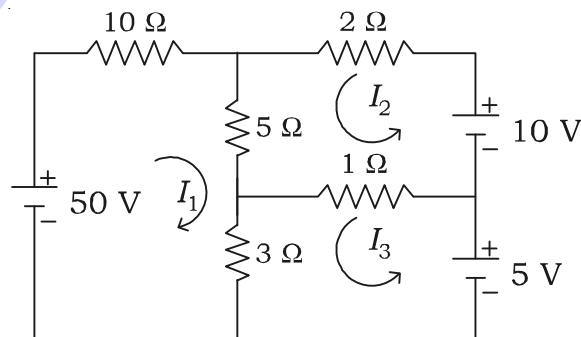
10×5=50

- 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.

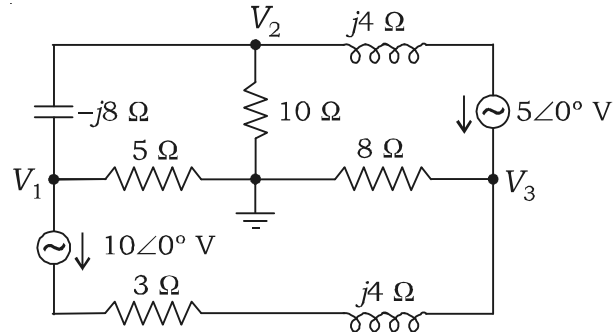
11. (a) Convert ideal voltage source to ideal current source and vice-versa.
(b) Find the voltage between A and B in the circuit using Kirchhoff's laws :



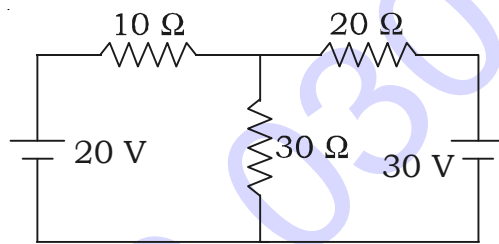
12. Determine the mesh currents I_1 and I_2 in the following circuit using mesh current analysis :



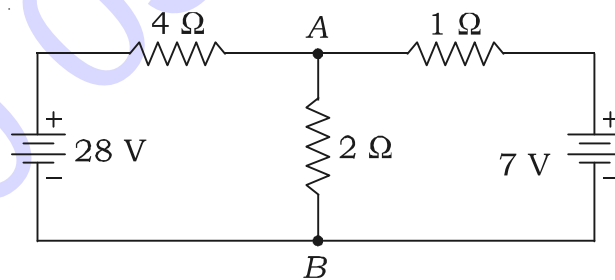
13. Write the node voltage equations for the network shown below and express them in matrix form :



14. Find the current through 30 ohm resistor by using super position theorem :



15. Draw the Thevenin's equivalent network for the given network between A and B :



16. (a) Derive an expression for the current in a Series RL circuit.
 (b) A series RL circuit with $R = 50$ ohm and $L = 10$ H has a constant voltage source $V = 100$ V applied at $t = 0$ and the inductor has no initial current. Find the equation for the current in the circuit.

17. Explain the initial value theorem and final value theorem.

18. Explain *T*-Attenuators with circuit diagram.

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