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C14–EC–403

4457

BOARD DIPLOMA EXAMINATION, (C–14)

SEPTEMBER/OCTOBER - 2020

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. Draw the equivalent current source for a voltage source of 12 V in series with 6 resistance.

2. State Ohm's law and write its limitations.

3. What is duality of an electric network?

4. Define loop and node.

5. State Thevenin's theorem.

6. State the maximum power transfer theorem for a.c. load.

7. Define initial conditions and transients.

8. Give the conditions for symmetry and reciprocity in terms of *Y* and *H* parameters.

9. Define characteristic impedance and propagation constant.

10. Write the applications of an equalizer.

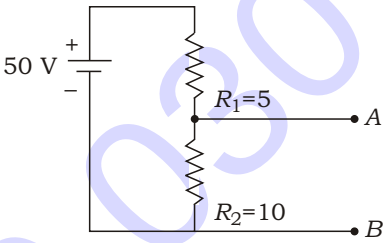
PART—B

10×5=50

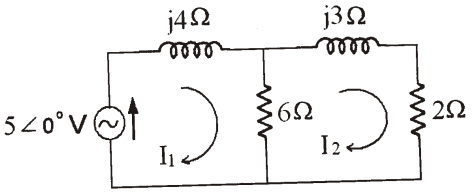
Instructions : (1) Answer *any* **five** questions.
(2) Each question carries **ten** marks.
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

11. *(a)* Explain ideal voltage source and ideal current source. 5

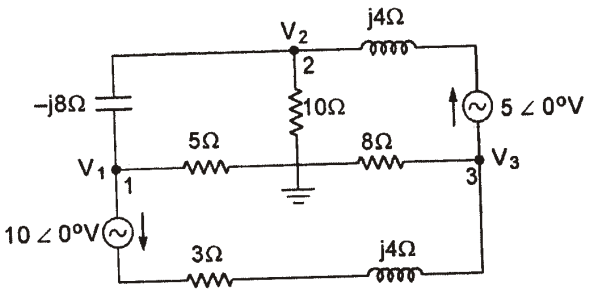
(b) Determine the voltage across the 10 resistor in circuit shown below : 5



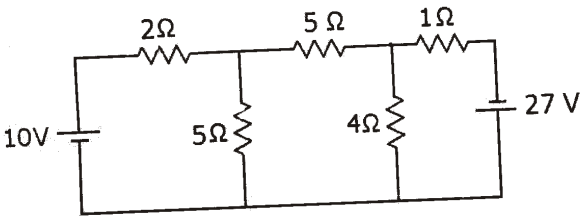
12. Write the mesh current equations for the circuit shown below and determine the currents I_1 and I_2 :



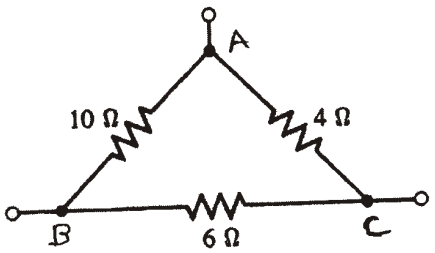
13. Write the node voltage equations for the network shown below and express them in matrix form :



14. Find the current through 2 resistor using superposition theorem :



15. *(a)* Convert the following delta network into equivalent star network : 5



(b) The three resistances 100 , 200 and 300 form star network. Obtain the values of resistances of equivalent delta network. 5

16. Explain the transient analysis of an RC circuit for d.c. excitation.

17. Explain the open-circuit impedance (Z) parameters with equivalent circuit.

18. Design a low-pass filter (both T and sections) having a cutoff frequency of 2 kHz to operate with a terminated load resistance of 500 .

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