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C14–AEI–**402**

4414

BOARD DIPLOMA EXAMINATION, (C–14)

MARCH/APRIL—2016

DAEIE—FOURTH SEMESTER EXAMINATION

NETWORK THEORY

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 Kirchhoff's voltage law.

2. Define passive circuits.

3. Define branch and loop in circuits.

4. Define twigs and links in circuits.

5. Determine the number of nodes required to solve the given network.

6. Define ideal voltage source.

7. List any three limitations of Norton's theorem.

8. A sinusoidal voltage $v(t)$ $50\sin 1000t$ is applied across a pure capacitor of 50 F. Find current $i(t)$.

9. A voltage given by $v(t)$ $100\sin t$ is applied across a resistor of 10 . Find current $i(t)$.

10. Define Q-factor.

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. Derive the delta to star transformation formulae.

12. *(a)* State Kirchhoff's current law.

(b) For the circuit shown in Fig. 1, find the voltage across 30 resistor and the current passing through it.

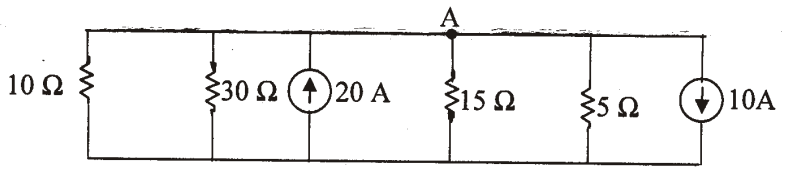

Fig. 1

13. Write the node voltage equations and arrange them in matrix form for the network shown in Fig. 2.

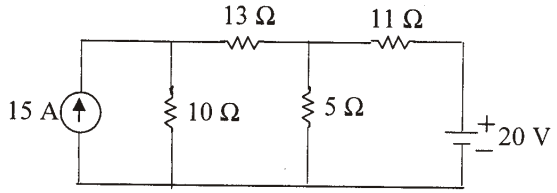

Fig. 2

14. In the circuit shown in Fig. 3, find the voltage V_{AB} by mesh current methods.

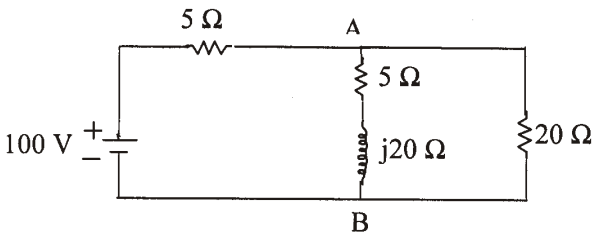

Fig. 3

15. Determine the maximum power delivered to the load in the circuit shown in Fig. 4.

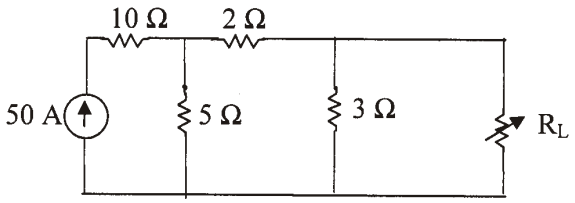

Fig. 4

16. Find the Thevenin's equivalent circuit at the terminals, *A* and *B* for the network shown in Fig. 5.

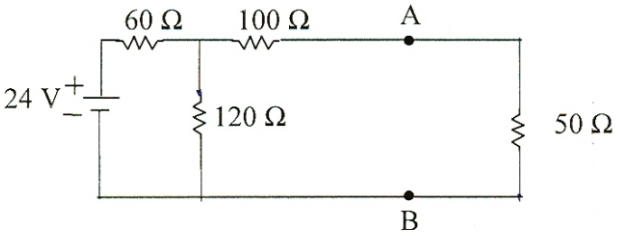

Fig. 5

17. Derive the relationship between voltage and current in pure capacitive circuits.

18. Derive the impedance, current and phase angle in series *R-L* circuit.

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