1. Which network theorem is used to simplify a complex network into an equivalent circuit consisting of a single voltage source and a single series resistance?

a) Superposition theorem
b) Thevenin’s theorem
c) Norton’s theorem
d) Reciprocity theorem

Answer: b) Thevenin’s theorem

Explanation: Thevenin’s theorem states that any linear electrical network with voltage and current sources and resistances can be replaced at terminals A-B by an equivalent voltage source Vth in series with an equivalent resistance Rth.

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2. Which theorem facilitates the calculation of the maximum power transfer from a source to a load in a network?

a) Superposition theorem
b) Maximum Power Transfer theorem
c) Norton’s theorem
d) Compensation theorem

Answer: b) Maximum Power Transfer theorem

Explanation: The Maximum Power Transfer theorem states that maximum power is

transferred from a source to a load when the load resistance is equal to the internal resistance of the source.

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3. Tellegen’s theorem relates to which aspect of electrical networks?

a) Superposition
b) Compensation
c) Maximum Power Transfer
d) Energy conservation

Answer: d) Energy conservation

Explanation: Tellegen’s theorem is a fundamental principle in electrical network theory that states the algebraic sum of electrical potentials in a network is zero due to energy conservation.

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4. Which theorem states that the response in any branch of a linear bilateral network due to a single independent source is equal to the response when that independent source is replaced by a short circuit or an open circuit?

a) Superposition theorem
b) Reciprocity theorem

c) Substitution theorem
d) Compensation theorem

Answer: c) Substitution theorem

Explanation: Substitution theorem states that the response in any branch of a linear bilateral network due to a single independent source is equal to the response when that independent source is replaced by a short circuit or an open circuit.

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5. In Millman’s theorem, what type of elements are typically found in the branches of the network?

a) Capacitors
b) Voltage sources
c) Inductors
d) Resistors

Answer: b) Voltage sources

Explanation: Millman’s theorem is used to find the voltage across parallel branches of a network where each branch consists of a voltage source in series with a resistor.

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6. Which theorem allows the simplification of a network containing dependent sources into an equivalent circuit?

a) Superposition theorem
b) Compensation theorem
c) Millman’s theorem
d) Tellegen’s theorem

Answer: b) Compensation theorem

Explanation: Compensation theorem facilitates the simplification of a network containing dependent sources into an equivalent circuit by transferring the dependent sources to a load.

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7. The Norton’s theorem is a dual to which theorem?

a) Superposition theorem
b) Thevenin’s theorem
c) Compensation theorem
d) Millman’s theorem

Answer: b) Thevenin’s theorem

Explanation: Norton’s theorem is the dual of Thevenin’s theorem, providing an alternative method to simplify complex networks.

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8. Which theorem is primarily used to analyze circuits with alternating current (AC)?

a) Norton’s theorem
b) Superposition theorem
c) Maximum Power Transfer theorem
d) Tellegen’s theorem

Answer: d) Tellegen’s theorem

Explanation: Tellegen’s theorem is applicable to both DC and AC circuits and is based on the principle of energy conservation.

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9. What is the primary focus of the Superposition theorem in network analysis?

a) Finding maximum power transfer
b) Simplifying complex networks
c) Analyzing circuits with dependent sources
d) Evaluating the effect of multiple sources

Answer: d) Evaluating the effect of multiple sources

Explanation: Superposition theorem allows the effects of multiple sources in a network to be analyzed individually by considering one source at a time and summing the results.

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10. Which theorem is particularly useful for analyzing circuits with dependent sources, such as transistors?

a) Reciprocity theorem
b) Millman’s theorem
c) Compensation theorem
d) Substitution theorem

Answer: c) Compensation theorem

Explanation: Compensation theorem is particularly useful for analyzing circuits with dependent sources by simplifying them into equivalent circuits.