

Easy

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Consider the following statements: 1. A current source in parallel with a resistor can be converted into a voltage source in series with same resistance. 2. A 2A current

A

1 and 2 only

B

2 and 3 only

C

1 and 3 only

D**1, 2 and 3****Correct**

Correct Answer: D

Full Detailed Explanation

Correct Answer: D - 1, 2 and 3 Quick Concept Explanation Source transformation preserves the terminal voltage-current behavior of a linear source-resistance pair. A voltage source V_s in series with R is equivalent to a current source $I_s = V_s/R$ in parallel with the same R , and conversely $V_s = I_s R$. Key relation: $V_s = I_s R$; $I_s = V_s/R$. Exam focus: Keep the resistance value unchanged when converting the source form. Common trap: Do not place the transformed resistor in the wrong series/parallel position. Statement-wise Verification Statement 1 - Correct. A current source in parallel with a resistor can be converted into a voltage source in series with same resistance. A voltage source V_s in series with R is equivalent to a current source $I_s = V_s/R$ in parallel with the same R , and conversely $V_s = I_s R$. Statement 2 - Correct. A 2A current source in parallel with $5\ \Omega$ is equivalent to 10 V voltage source in series with $5\ \Omega$. A voltage source V_s in series with R is equivalent to a current source $I_s = V_s/R$ in parallel with the same R , and conversely $V_s = I_s R$. Statement 3 - Correct. Source transformation is valid only for linear bilateral networks. Source transformation preserves the terminal voltage-current behavior of a linear source-resistance pair. Core Concept Source transformation preserves the terminal voltage-current behavior of a linear source-resistance pair. A voltage source V_s in series with