Moderate | Assistant Engineer (Electrical), Clas | 2025 | Building Department

# If 4 equations are required to describe a circuit by Mesh-Current method and there are n nodes, then how many branches are there in the network?

A. n + 5

B. **n + 3** — Correct

C. n

D. n 1

## Correct Answer: B

### Full Detailed Explanation

Concept & ReasoningMesh-current analysis uses one equation for each independent loop of a planar connected network. Graph theory gives the cyclomatic number L = b - n + 1, where b is the number of branches and n the number of nodes. With L = 4, rearranging yields b = n + 3. This relation is a frequent exam shortcut and avoids drawing or counting a particular circuit.How to Solve It in the ExamIndependent loops = branches - nodes + 1.Important Exam PointUse this relation only for a connected network; additional connected components change the graph formula.Related Revision PathThis question sits in the revision path Network Theory Graph Theory Mesh Analysis .

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