Network terminology and connectivity

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Edges are AB, AC, BC and CD. Find the degrees of A, B, C and D. [2 marks]

Count incident edges at each vertex.

The sum 8 is twice the 4 edges.

Answer: 2, 2, 3, 1.

2. For AB, AC, BC and CD, name a cycle. [2 marks]

All three edges exist.

The route closes without repeating an internal vertex.

Answer: A-B-C-A.

3. For AB, AC, BC and CD, identify a bridge. [2 marks]

D has no other connection.

Removing it isolates D.

Answer: C-D.

4. An undirected loop-free network has degrees 1, 2, 2 and 1. Find the edge count. [2 marks]

The degree sum is 6.

$\frac{6}{2} = 3$.

Answer: 3.

5. Edges are AB, BC and DE. How many components are present? [2 marks]

A, B and C form one component.

D and E form the other.

Answer: 2.

6. Can A-B-C-B-D be a path when paths may not repeat vertices? [2 marks]

B appears twice.

That violates the stated path rule.

Answer: No; it can be a walk if all edges exist.