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- Metabolic networks are often represented as: (a) Undirected graphs (b) Directed graphs (c) Weighted undirected graphs (d) Random graphs
- The “small-world effect” means: (a) All nodes connected directly (b) Short average path length despite large network size (c) Very low clustering coefficient (d) Diameter grows linearly with nodes
- A module in biology is: (a) Always a clique (b) A functional unit with stable internal properties (c) A random set of nodes (d) A node with highest degree
- Which best describes a motif? (a) A central hub (b) Over-represented subgraph with specific dynamic behavior (c) A module with all edges (d) A set of disconnected components
- A protein complex is best described as: (a) Proteins interacting at the same time and space (b) A loosely defined functional module (c) A motif in gene regulation networks (d) A small-world property

Graph G: Undirected, unweighted graph with nodes A–E. A connected to B, C. B connected to A, C, D. C connected to A, B, D. D connected to B, C, E. E connected to D.

- What is the degree of node B in Graph G? a) 2 b) 3 c) 4 d) 5
- What is the diameter of Graph G? a) 2 b) 3 c) 4 d) 5
- The closeness centrality of node B is:

$$C(B) = \frac{n-1}{\sum_{j \neq B} d(B, j)}$$

Choose the correct value of closeness: a) 0.5 b) 0.6 c) 0.8 d) 1.0

- Which node in Graph G has the highest betweenness centrality? a) A b) B c) C d) D
- Which statement is correct about Graph G? a) Node A has the highest degree centrality b) Node D has the highest betweenness centrality c) Node E has the highest closeness centrality d) Node B has the lowest degree centrality