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- Gene regulation networks are typically modeled with: (a) Undirected edges (b) Directed edges (c) Weighted but undirected edges (d) No edges
- In a small-world network, the diameter is: (a) Proportional to number of nodes (b) Very large (c) Relatively small regardless of network size (d) Undefined
- In scale-free networks, hubs: (a) Never exist (b) Provide robustness but also vulnerability to targeted attacks (c) Are randomly distributed (d) Have the same degree as all other nodes
- Which is an example of a network motif? (a) Negative feedback loop (b) A hub node (c) A connected component (d) A cluster with no edges
- Protein complexes are: (a) Randomly grouped proteins (b) Functional modules active simultaneously (c) Cliques with no biological meaning (d) Nodes with betweenness & closeness

**Graph J:** Undirected, unweighted graph with nodes P–U. P connected to Q. Q connected to P, R. R connected to Q, S, U. S connected to R, T. T connected to S. U connected to R.

- What is the degree of node R in Graph J? a) 1 b) 2 c) 3 d) 4
- What is the diameter of Graph J? a) 2 b) 3 c) 4 d) 5
- The closeness centrality of node R is:

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

Choose the closest value of closeness: a) 0.50 b) 0.60 c) 0.70 d) 0.80

- Which node in Graph J has the highest betweenness centrality? a) P b) Q c) R d) S
- Which statement is correct about Graph J? a) Node P has the highest degree centrality b) Node T has the highest closeness centrality c) Node U has the highest betweenness centrality d) Node R has the highest betweenness centrality