# BRAC University
## Department of Computer Science and Engineering

CSE 443: Bioinformatics-I

Quiz 05: Summer 2025 Time: 20 Minutes Marks: 15

| Name | | ID | | Section | |
|---|---|---|---|---|---|

1. In a protein-protein interaction (PPI) network, edges are typically: (a) Directed (b) Weighted (c) Undirected (d) Both directed and weighted

2. The adjacency matrix of an undirected unweighted graph is always: (a) Diagonal (b) Symmetric (c) Sparse (d) Triangular

3. Scale-free networks are characterized by: (a) All nodes having the same degree (b) Most nodes with low degree and few hubs with high degree (c) Every node connected to every other node (d) Uniform edge weights

4. A network with high transitivity indicates: (a) Sparse connectivity (b) Strong modular structure with clusters (c) Absence of hubs (d) Randomness in connectivity

5. If failures in a scale-free network occur randomly, the network is: (a) Highly unstable (b) Stable, because hubs are less likely to be affected (c) Always disconnected (d) Reduced to isolated cliques

**Graph K:** Undirected, unweighted graph with nodes V–Z. V connected to W. W connected to V, X, Y. X connected to W, Z. Y connected to W. Z connected to X.

6. What is the degree of node W in Graph K? a) 1 b) 2 c) 3 d) 4

7. What is the diameter of Graph K? a) 2 b) 3 c) 4 d) 5

8. The closeness centrality of node W is:

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

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

9. Which node in Graph K has the highest betweenness centrality? a) V b) X c) Y d) W

10. Which statement is correct about Graph K? a) Node V has the highest degree centrality b) Node Z has the highest closeness centrality c) Node X has the highest betweenness centrality d) Node W has the highest betweenness centrality