**Final quiz practice**

**Select the best answer.**

Let G(V, E) be a connected graph such that |V| = 9. Select the statement that is always true?

(A) |E| ≥ 29

**(B) |E| ≥ 8**

(C) |E| ≥ 36

(D) |E| ≥ 9

Let G be a graph. Let Gc be the complement of G. Select the statement that is always true.

(A) G or Gc is connected.

(B) If G is connected, Gc is disconnected.

(C) If G is connected, Gc is connected.

(D) All of the above.

In order to determine whether or not a graph has an odd cycle, we use:

(A) Topological ordering

(B) BFS

(C) DFS

(D) none of the above

A graph G has exactly two components Then G is a

(A) Forest

(B) complete graph

**(C) disconnected graph**

(D) bipartite graph

Let C be a connected component of a graph. If |V(C)| = k, then the maximum number of edges in C is

(A) k 2 / 2.

(B) (k2 + k)/2.

(C) k 2.

**(D) (k2 – k)/2**

**True or False questions.**

\_\_\_\_\_There is a graph with seven vertices such that its vertices has the following vertex degrees: 3, 5, 3, 4, 2, 6, 4.

\_\_\_\_\_A connected component on n vertices and n edges may or may not have a cycle.

\_\_\_\_\_We use dynamic programming to reduce the complexity due to the dynamic nature of the problem.

\_\_\_\_\_In the case of an undirected graph, a minimum spanning tree can be used to compute the shortest path between any two vertices.

\_\_\_\_\_Not every NP-Complete problem can be verified in Polynomial-time.

\_\_\_\_\_There are problems in P that are not in NP.

\_\_\_\_\_If there is a polynomial reduction from problem A to Problem B means if you have polynomial time algorithm to solve Problem A, then we have a polynomial time algorithm for Problem B.

\_\_\_\_\_A problem P is NP-hard if for every problem S in NP, P is polynomial reducible to S.