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) $|E| \geq 29$
(B) $|E| \geq 8$
(C) $|E| \geq 36$
(D) $|E| \geq 9$

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) $(k^2 + k)/2$.
(C) k^2.
(D) $(k^2 – k)/2$

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.