**1.** Consider an instance of the single-source shortest path problem with $n$ vertices, $m$ edges, a source vertex $s$, and no negative cycles. Which of the following is true?

1. For every vertex $v$ reachable from source $s$, there is a shortest $s - v$ path with at most $n - 1$ edges.

2. For every vertex $v$ reachable from the source $s$, there is a shortest $s - v$ path with at most $n$ edges.

3. For every vertex $v$ reachable from the source $s$, there is a shortest $s - v$ path with at most $m$ edges.

4. There is no finite upper bound on the fewest number of edges in a shortest $s - v$ path.

(1) is the correct answer. If we had a shortest $s - v$ path with more than $n - 1$ edges then we have a non-negative cycle, removing this cycle would produce a $s - v$ path of at most $n - 1$ edges that is better than the previous solution.