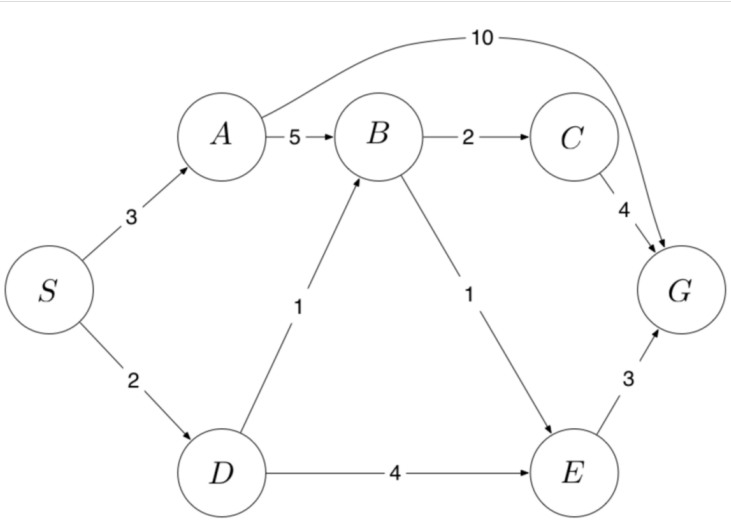
CS246F24: Artificial Intelligence
Quiz 1

Name: _____

1. (a) Define reflex agents in one line? Can a reflex agent be rational?
   (b) Let's have a single-agent path finding problem (assume a PacMan grid), where an agent needs to go from the start location to target location. AssumeThe agent can perform 4 actions (NSEW). The total number of location the agent can visit (including start and end) is 10. What would be the size of the state space?
   (c) What are the Time and Space complexity of BFS search? Is BFS search complete? Is it optimal? Briefly state if any assumption made. You can assume cost of evey action is 1.
   (d) What are the Time and Space complexity of DFS search? Is DFS search complete? Is it optimal? You can assume cost of evey action is 1.
2. If you were to design an autonomous car, state the PEAS (Performance Measure, Environment, Actuators, Sensors) description for this task.
3. The following graph is given and you have to find a path from S to G. What solution is returned by:



   (a) depth-first tree search? Assume nodes are explored in Lexicographical order.
   (b) breadth-first tree search? Assume nodes are explored in Reverse Lexicographical order.

   Write down the expanded nodes and the nodes on the fringe. Clearly show the order in which you build the search tree. Finally, provide the final path and its cost.