

CS-171, Intro to A.I., Winter Quarter, 2016 — Quiz # 2 — 20 minutes

NAME: _____

YOUR ID: _____ ID TO RIGHT: _____ ROW: _____ SEAT: _____

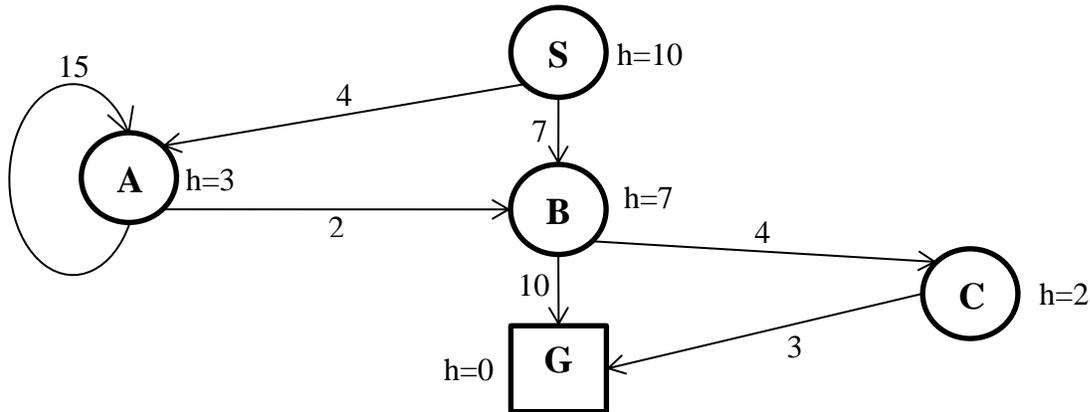
1. (60 pts total, 4 pts each) For each of the following terms on the left, write in the letter corresponding to the best answer or the correct definition on the right. The first one is done for you as an example.

A	Agent	A	Perceives environment by sensors, acts by actuators
	Percept	B	All states reachable from the initial state by a sequence of actions
	Performance Measure	C	Guaranteed to find a solution if one is accessible
	Rational Agent	D	Process of removing detail from a representation
	State Space	E	Maximum number of successors of any node
	Search Node	F	Set of all leaf nodes available for expansion at any given time
	Link between nodes	G	Estimates cost of cheapest path from current state to goal state
	Path	H	Guaranteed to find lowest cost among all accessible solutions
	Abstraction	I	Represents a state in the state space
	Optimal Search	J	Sequence of states connected by a sequence of actions
	Complete Search	K	Agent's perceptual inputs at any given instant
	Expand a state	L	Agent that acts to maximize its expected performance measure
	Frontier	M	Apply each legal action to a state, generating a new set of states
	Search Strategy	N	Represents an action in the state space
	Branching Factor	O	How a search algorithm chooses which node to expand next
	Heuristic Function	P	Evaluates any given sequence of environment states for utility

****** TURN PAGE OVER AND CONTINUE ON THE OTHER SIDE ******

2. (40 pts total, 10 pts each) Execute Tree Search through this graph (i.e., do not remember visited nodes). Step costs are given next to each arc. Heuristic values are given next to each node (as $h=x$). The successors of each node are indicated by the arrows out of that node. Successors are returned in left-to-right order, i.e., successors of S are (A, B), successors of A are (A, B), and successors of B are (G, C), in that order.

For each search strategy below, show the order in which nodes are expanded (i.e., to expand a node means that its children are generated), ending with the goal node that is found, or indicate the repeating cycle if the search gets stuck in a loop. Show the path from start to goal, or write "None". Give the cost of the path found. The first one is done for you as an example.



2.a. DEPTH FIRST SEARCH.

Order of node expansion: S A A A A A ...

Path found: None Cost of path found: N/A

2.b. (10 pts) UNIFORM COST SEARCH.

(4 pts) Order of node expansion: _____

(4 pts) Path found: _____ (2 pts) Cost of path found: _____

2.c. (10 pts) GREEDY (BEST-FIRST) SEARCH.

(4 pts) Order of node expansion: _____

(4 pts) Path found: _____ (2 pts) Cost of path found: _____

2.d. (10 pts) ITERATED DEEPENING SEARCH.

(4 pts) Order of node expansion: _____

(4 pts) Path found: _____ (2 pts) Cost of path found: _____

2.e. (10 pts) A* SEARCH.

(4 pts) Order of node expansion: _____

(4 pts) Path found: _____ (2 pts) Cost of path found: _____