CS-171, Intro to A.I., Fall Quarter, 2014 — Quiz # 1 — 20 minutes

NAME: _____

YOUR ID: _____ ID TO RIGHT:_____ ROW:____ NO. FROM RIGHT:____

1. (45 pts total, 3 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

2. (20 pts total, 5 pts each) Your book defines a task environment as a set of four things, with acronym PEAS. Fill in the blanks with the names of the PEAS components.

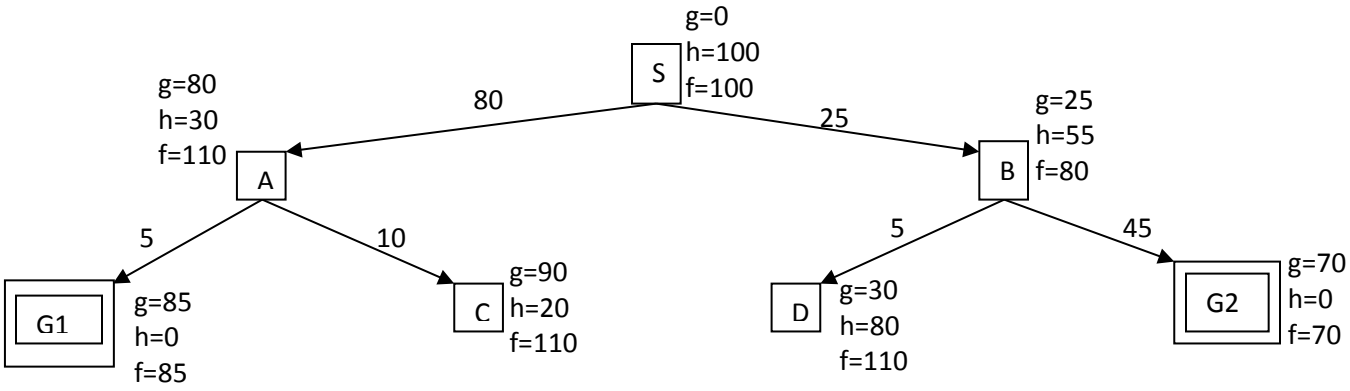
P_____ E_____ A_____ S_____

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

3. (35 pts total) Search the following tree using the indicated search strategy. Assume that S is the start node and G1 and G2 are both goal nodes (double boxes). Here, path costs are shown to the right of each path, g = cost of path so far, h = estimate of remaining cost to goal, f = estimate of total path cost.

By convention, when a node is expanded the children are returned from the expansion in left-to-right order. Expanding S yields (A, B); expanding A yields (G1, C); and expanding B yields (D, G2); 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. Show the path from start to goal, or write "None". Give the cost of the path found, if any. The first one is done for you, as an example.



3.a. DEPTH FIRST SEARCH.

Order of node expansion: S A G1

Path found: S A G1 Cost of path found: 85

3.b. (15 pts) ITERATED DEEPENING SEARCH.

Order of node expansion: _____

Path found: _____ Cost of path found: _____

3.c. (15 pts) A* SEARCH.

Order of node expansion: _____

Path found: _____ Cost of path found: _____

3.d. (5 pts) Is the heuristic admissible? (Y=Yes or N=No) _____