CS-171, Intro to A.I., Fall Quarter, 2015 — Quiz # 1 — 20 minutes

NAME: _____

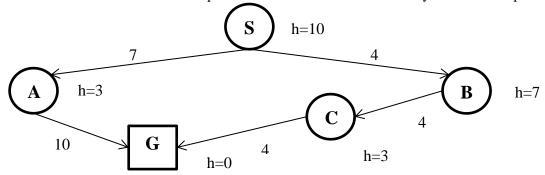YOUR ID:_____ ID TO RIGHT:_____ ROW:_____ SEAT:_____

1. (52 pts total, 4 pts each) Properties of task environments. For each of the following terms or phrases 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
	Episodic	B	Sensors give complete state of environment at each time point
	Discrete	C	More than one agent in the task environment
	Static	D	Next state is exactly determined by current state and agent action
	Nondeterministic	E	The current decision could affect all future decisions
	Sequential	F	Environment can change while the agent is deliberating
	Semidynamic	G	Finite number of states, percepts, and actions
	Deterministic	H	The outcomes (or probabilities) for all actions are given
	Fully observable	I	Environment does not change while the agent is deliberating
	Uncertain	J	Environment does not change while the agent is deliberating, but its performance measure does
	Known	K	A series of atomic episodes, each independent of prior agent actions
	Multiagent	L	Next state not exactly determined by current state and agent action
	Stochastic	M	Not fully observable or not deterministic
	Dynamic	N	Actions are characterized by their *possible* outcomes, but no probabilities are attached to them

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2. (48 pts total, 12 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.

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. The first one is done for you as an example.

2.a. DEPTH FIRST SEARCH.

Order of node expansion: S A G

Path found: S A G   Cost of path found: 17

2.b. (12 pts) UNIFORM COST SEARCH.

(5 pts) Order of node expansion:

(5 pts) Path found: **(2 pts)** Cost of path found:

2.c. (12 pts) GREEDY (BEST-FIRST) SEARCH.

(5 pts) Order of node expansion:

(5 pts) Path found: **(2 pts)** Cost of path found:

2.d. (12 pts) ITERATED DEEPENING SEARCH.

(5 pts) Order of node expansion:

(5 pts) Path found: **(2 pts)** Cost of path found:

2.e. (12 pts) A* SEARCH.

(5 pts) Order of node expansion:

(5 pts) Path found: **(2 pts)** Cost of path found: