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National University of Computer & Emerging Sciences
Artificial Intelligence (CS401)
Quiz#3

Dated: February xx, 2014 Marks: 20
Time: 20 min. Std-ID: ____SOL_____

Question No. 1 Indicate whether True or False

1. Breadth first search is a special case of uniform cost search. T
2. Uniform-cost search is a variant of best-first search. T
3. Depth first search is neither complete nor optimal. T
4. Uniform-cost search is a special case of the A* search algorithm if it's heuristic is a constant function. T
5. The space complexity of A* is still prohibitive. T
6. A* uses a best-first search and finds a least-cost path from a given initial node to one goal node (out of one or more possible goals). T
7. A* is admissible and considers fewer nodes than any other admissible search algorithm with the same heuristic. T
8. Bidirectional search is a general search strategy. F
9. Depth Limited search is optimal. F
10. Iterative deepening search calls depth-first search with increasing depth limits until a goal is found. T

Question No. 2 Define the following terms? [2.5 x4]

Uninformed search	Informed search methods may have access to a heuristic function h(n) that estimates the cost of a solution from n.
Heuristic function	A function h(n), called Heuristic Function that estimates the cost of a solution from n.
State Space Search	State Space Search consists of a collection of states, a set of operators that map state transition, two distinct states initial and goal state. A transition sequences that link initial state to goal state.
Goal Test	A test that can be used to check whether we have reach to a goal state or not.

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Question No. 1 Indicate whether True or False

1. Uniform cost search is a special case of breadth first search. F
2. Depth first search is a variant of best-first search. T
3. Breadth first search is complete and optimal, under constant branching-factor and constant cost. T
4. Uniform-cost search is a special case of the A* search algorithm if it's heuristic is a constant function. T
5. The space complexity of A* is still prohibitive. T
6. A* uses a best-first search and finds a least-cost path from a given initial node to one goal node (out of one or more possible goals). T
7. A* is admissible and considers fewer nodes than any other admissible search algorithm with the same heuristic. T
8. Bidirectional search is a general search strategy. F
9. Limited depth first search is optimal. F
10. Iterative deepening search calls depth-first search with increasing depth limits until a goal is found. T

Question No. 2 Compare the following pair of terms. [5 x 2]

(a)	**Breadth First Search**	**Depth First Search**
	Breadth-first search expands the shallowest nodes first; it is complete, optimal for unit step costs, but has exponential space complexity.	Depth-first search expands the deepest unexpanded node first. It is neither complete nor optimal, but has linear space complexity.
(b)	**Informed search**	**Uninformed search**
	An informed search method uses other information from the problem other then problem definition.	Uninformed search methods have access only to the problem definition.
	Informed search methods may have access to a heuristic function h(n) that estimates the cost of a solution from n.	