**Artificial Intelligence Midterm Exam (ENCS434) - Fall 2015**

Q1) you have a robot, that is initially in a lander (عربة), we need the robot to go to 3 places and collect some rocks and get back to lander, given that the time for the robot to get to each place and collect rocks is known.

1. Write formulation for this problem.
2. What is the search that can be used here to find the optimal solution (in case of informed search), and what is the best search type for this (in case un-informed search). [note by Hussein: if the doctor didn’t told you the wanted search type (informed or un-informed), then write the solution for both cases]
3. What we can use as a heuristic for this problem?

Q2)

1. The A\* Search may behave like BFS (Breadth-First Search), write at scenario that describes this case.
2. Find the solution (path) for getting from start node to final node in the given graph, using:
3. DFS (Depth-First Search)
4. A\* Search
5. Hill Climbing Search [note by Hussein: the start node heuristic was larger then its neighbors, so the search stucks at start node (A), and it won’t go any further…this was the answer for an 8 grades question :\ ]
6. Is the heuristic given with the graph admissible? [note by Hussein: the answer was no, just give a counter example]
7. What is the Draw back of the arc consistency algorithm (a CSP Algorithm)? And what is the solution for it?
8. Part E was a problem on games chapter (with pruning, somewhat like the homework question)

Q3)

1. convert this natural language sentence to logic sentence (2 parts).
2. Use an algorithm to solve this question [can’t remember the algorithm, see the solution, may you can remember it]
3. Does this logic sentence represent the following given natural language sentence? If no, write the correct representation.
4. Use another algorithm to solve this problem [can’t remember exactly what the algorithm was, I think it was a forward or backward algorithm].

Q4) A question on Planning chapter (the chapter the comes after Logic chapter).

Notes:

1. This questions was written based on what I could remember from the exam after seeing the solution attached, so if anything confuses you, just ignore it, since maybe I didn’t write it correctly.
2. Anything in square brackets [ ], is a note from me, and it is for sure was not included in the question.

**Best Wishes**

**Hussein Dahir**