



College of Engineering

Course Title: **Artificial Intelligence**

Final Exam
Theoretical Exam

Student No: _____

Student Name: _____

Exam Time: 2 Hours
No of Questions: Six
Open Book: No

2nd Semester 2010/2011
Total Grade: 50
Using Computer: No

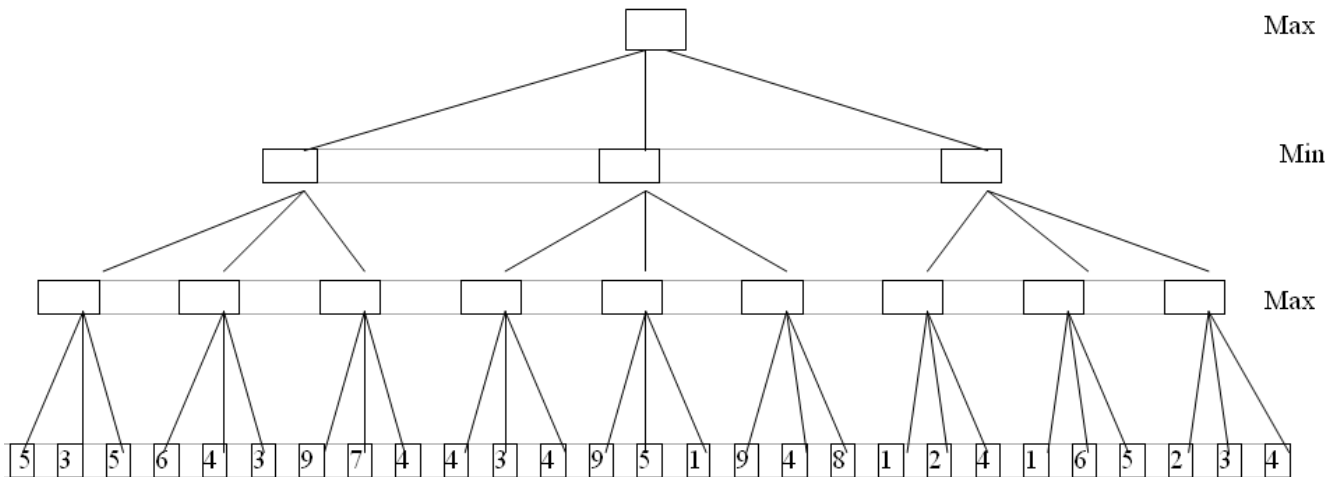
Date: 21/5/2011 1:00 PM
Try to Answer All Questions
Using Calculator: No

First Question

(10/50)

Find the optimal path using the following algorithms:

- a) Mini Max
- b) Alpha Beta Prune a



Second Question

(8/50)

True / False

1. _____ A* is not always “the best” algorithm
2. _____ Iterative Deepening A* explores paths within a given contour (f-cost limit) in a breadth-first manner
3. _____ Simplified Memory-Bounded A* often better than A* and IDA*
4. _____ Local Beam Search keeps k states in memory, instead of only one.
5. _____ logic provides a flexible and powerful framework for representation and reasoning
6. _____ The meaning of a sentence can be constructed from the meanings of its parts is called compositionality
7. _____ Grounding is the connection between the real world and the model/reasoning process
8. _____ A sentence α is entailed by a knowledge base KB if the models of the knowledge base KB are also models of the sentence α

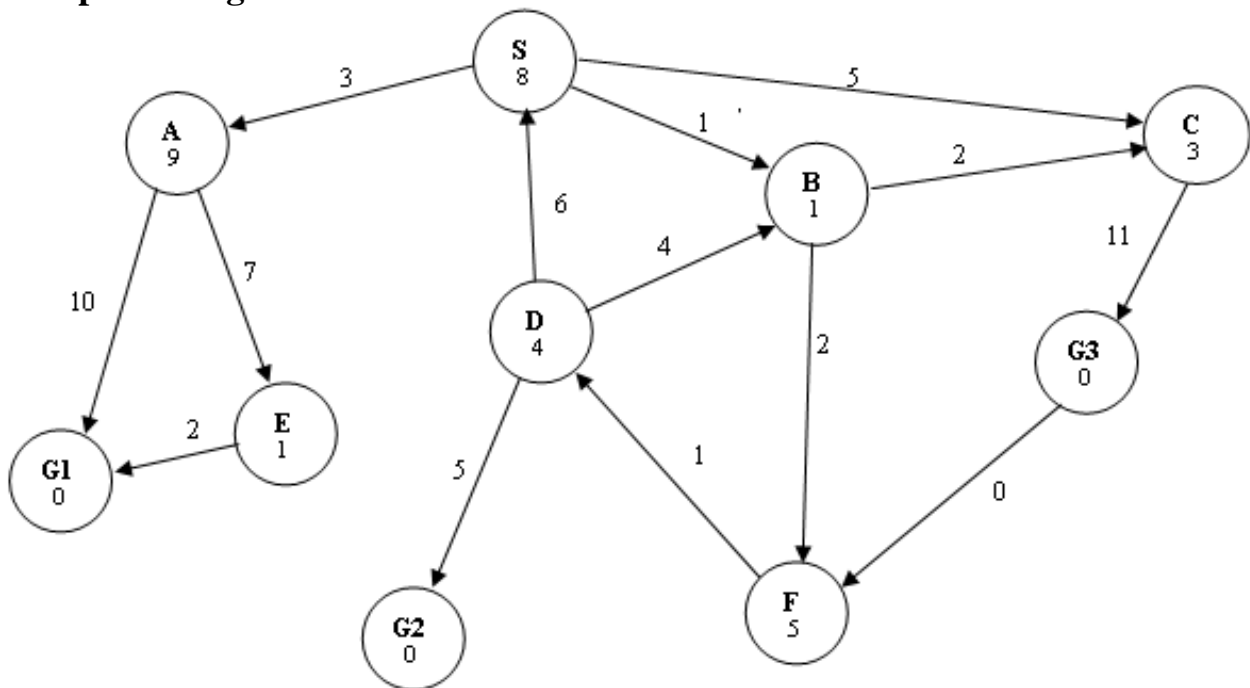


Third Question

(10/50)

Consider the search space below, where S is the start node and $G1$, $G2$, and $G3$ satisfy the goal test. Arcs are labeled with the cost of traversing them and the estimated cost to a goal is reported inside nodes.

Find the path using A^*



Forth Question

(5/50)

You learned a simple evaluation function in **Tic-Tac-Toe** game: $E(s) = (rx + cx + dx) - (ro + co + do)$ where r, c, d are the numbers of row, column and diagonal lines still available; x and o are the pieces of the two players.

Give another evaluation function for this game.

Fifth Question

(10/50)

1. Write Prolog predicate that find the length of a list. $Length(L, N)$.
2. Write a predicate to find the fact (N, D) . for example
 $? fact(5, D)$.
 $D = 120$.



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Sixth Question

(7/50)

Suppose we are given a knowledge base with the following facts:

tran(eins,one).

tran(zwei,two).

tran(drei,three).

tran(vier,four).

tran(fuenf,five).

tran(sechs,six).

tran(sieben,seven).

tran(acht,eight).

tran(neun,nine).

*Write a predicate **listtran(G,E)** which translates a list of German number words to the corresponding list of English number words.*

For example:

listtran([eins,neun,zwei],X).

should give:

X = [one,nine,two].

End of Questions

Good Luck