CS347 FS2004 Exam 3

This is a closed-book exam. The only items not supplied that you are allowed to use are writing implements. Mark every sheet of paper you use with your name and the string “cs347fs2004 exam3” (omittance, even if it is partial, will be penalized at 1 point per sheet). If you are caught cheating, you will receive a zero grade for this exam. The max number of points per question is indicated in square brackets after each question. The sum of the max points is 50. You have 50 minutes to complete this exam. Good luck!

1. What is the advantage of adding alpha-beta pruning to a minimax algorithm? [4]

2. What is the advantage of adding a move-ordering heuristic to a minimax algorithm with alpha-beta pruning? [5]


The next three questions are about the following adversarial “chance” tree.

4. Calculate the EXPECTIMINIMAX values for nodes B, C and D in the above adversarial “chance” tree. Show your calculations! [3]

5. Which action will MAX choose, a₁, a₂, or a₃? Explain your answer! [2]

6. If the utility values given for MIN were multiplied with a positive constant c, which action would MAX then choose? Explain your answer! [3]
The questions on this page are about the following adversarial search tree. State evaluation heuristic values for the max player are provided in the form of numbers following the letter labels of the states (e.g., B5 indicates that the heuristic value of state B for the max player is 5). The order in which successors are generated is from left to right. Example: A generates first B, then C, and finally D.

You are also provided the following history table (note: non-listed moves default to a HT value of zero):

<table>
<thead>
<tr>
<th></th>
<th>AC</th>
<th>AD</th>
<th>DK</th>
<th>BE</th>
<th>BF</th>
<th>BG</th>
<th>FN</th>
<th>FO</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


8. What is the PV found by HTQSABDLM(A,3,2,−∞,∞)? [3]

9. Which nodes (if any) are pruned by HTQSABDLM(A,3,2,−∞,∞)? [4]