Part I. Word Problems.

Question 1

Strategy Sets
Pitcher (4 pure strategies): \{IU, OU, IL, OL\}
Hitter (16 p. strats):\{ IU/IU, IU/OU, IU/IL, IU/OL, OU/IU, OU/OU, OU/IL, OU/OL, IL/IU, IL/OU, IL/IL, IL/OL, OL/IU, OL/OU, OL/IL, OL/OL\}
Note: here, X/Y means "play strategy X if seeing U, and play strategy Y if seeing L".
**Question 3**

Strategy Sets:
- Hamilton: \{AK, AG, RK, RG\}
- Burr: \{G, K\}

Notes: Hamilton's strategy AK and AG is intuitive, and RK means: “play R, and then if observing (strategy by himself) A, then play K”.
Obviously, this if-condition is never satisfied. However, by definition it is still part of a strategy.
The second Hamilton move can be shown (with an info set) after the Burr move instead of before; that is an equivalent representation to the one shown.
Part II. Problems from Harrington.

Exercise 5

Exercise 8

<table>
<thead>
<tr>
<th>Player 1</th>
<th>Player 2</th>
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</thead>
<tbody>
<tr>
<td>a₂,c₁</td>
<td>a₂,d₂</td>
</tr>
<tr>
<td>a₂,c₂</td>
<td>5,2</td>
</tr>
<tr>
<td>a₂,d₁</td>
<td>20,3</td>
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<tr>
<td>b₂,c₁</td>
<td>0,0</td>
</tr>
<tr>
<td>b₂,d₁</td>
<td>0,0</td>
</tr>
</tbody>
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Part III. Tragedy of the commons analysis

a) $S^*=120$, which gives total payoff $120*120=14400$.

b) Yes; Yes.

c) The actual outcomes are generally larger than $S^*$. Because when one is making a decision, s/he only care about own payoff but does not consider about others.