1. (a) For example, ACG. (b) Four. (c) First solve the subgame on the left:

<table>
<thead>
<tr>
<th></th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C</strong></td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

There is a unique Nash equilibrium: (C,E). Now the subgame on the right:

<table>
<thead>
<tr>
<th></th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>G</strong></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>H</strong></td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

There is a unique Nash equilibrium: (G,K).

Thus there are two subgame-perfect equilibria: (ACG,EK) and (BCG,EK).

2. (a) Only the one that starts at Player 3’s node after choice C. (b) One. (c) $2^3 = 8$. (d) For example, DFM. (e) $2^2 = 4$. (f) For example, GK

3. (a) Neither Player 1 nor Player 3 have a strictly dominated strategy. For Player 2 $C$ is strictly dominated by $D$.

(b) At a Nash equilibrium no strictly dominated strategy can be played with positive probability; thus Player 2 must play $D$. Hence the game can be simplified to the following two-player game:

<table>
<thead>
<tr>
<th></th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>3, 2</td>
<td>1, 3</td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>1, 4</td>
<td>5, 2</td>
</tr>
</tbody>
</table>

This game has no pure-strategy Nash equilibria. To find the mixed-strategy Nash equilibrium, let $p$ be the probability of $A$ and $q$ the probability of $E$. Then $p$ and $q$ must be the solutions to:

$3q + 1 - q = q + 5(1 - q)$ and $2p + 4(1 - p) = 3p + 2(1 - p)$. The solutions are $p = \frac{2}{3}$ and $q = \frac{2}{3}$. 

Page 1 of 2
Thus the Nash equilibrium of the original games is 
\[
\begin{pmatrix}
A & B & C & D & E & F \\
\frac{2}{3} & \frac{1}{3} & 0 & 1 & \frac{2}{3} & \frac{1}{3}
\end{pmatrix}.
\]
Player 1’s expected payoff is \( \frac{7}{3} \), Player 2’s expected payoff is \( \frac{5}{3} \) and Player 3’s expected payoff is \( \frac{8}{3} \).

(c) The extensive game is as follows (this is just one of many possible representations: the order of moves in the proper subgame can be changed):

\[
\begin{array}{c}
\text{not play} \\
\text{play}
\end{array}
\]

\begin{array}{c}
A \\
B
\end{array}

\begin{array}{c}
C \\
D
\end{array}

\begin{array}{c}
E \\
F
\end{array}

\begin{array}{c}
0 \\
2 \\
3 \\
1 \\
1 \\
1 \\
5 \\
1 \\
0 \\
2 \\
1 \\
0 \\
2 \\
3 \\
1 \\
4 \\
2
\end{array}