Multiple Choice: Circle ONE answer for each of the following questions.

1. ans: C
2. ans: B
3. ans: B
4. ans: B
5. ans: A

Short Answer Questions: For calculations, show how you set-up each problem to receive full credit.

6. ans: Blue, Red, Black, White
7. (a) ans: Extend tree shown in Example 6 p. 549
   (b) ans: Player B
   (c) ans: One such branch is where Player B reduces the pile to 3 pebbles. This results in a win for Player B regardless of Player A’s move.
8. A family is trying to decide where to go for their summer vacation among the choices Virginia Beach, camping in the mountains, or New York City. The girls offer their suggestion first, followed by the boys. The parents will choose from among the choices offered (by their children) based on their preferences. Assume preference for all the groups are known. Their preference rankings are:

<table>
<thead>
<tr>
<th>Rank</th>
<th>Girls</th>
<th>Boys</th>
<th>Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>Beach</td>
<td>Camp</td>
<td>NYC</td>
</tr>
<tr>
<td>Second</td>
<td>NYC</td>
<td>Beach</td>
<td>Camp</td>
</tr>
<tr>
<td>Third</td>
<td>Camp</td>
<td>NYC</td>
<td>Beach</td>
</tr>
</tbody>
</table>

   (a) ans: Modify tree shown in book for Example 5 p. 548 to this word problem.
   (b) ans: Girls optimal play to select NYC, Boys optimal play is to pick anything (their choice does not matter) and the result will be be going to NYC
9. ans:

<table>
<thead>
<tr>
<th>Submissive Pig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press Don’t Press</td>
</tr>
<tr>
<td>Dominant Pig</td>
</tr>
<tr>
<td>Press</td>
</tr>
<tr>
<td>Don’t</td>
</tr>
</tbody>
</table>

10. (a) ans: (R2,C3), (R3,C4) and (R4,C2)
11. (a) ans: (R4,C4)  
(b) ans: Reduces to only the entry (R4,C4)

12. (a) ans: $E_{R1} = 1.9$, $E_{R2} = 4.2$, Pick R2.  
(b) ans: $E_{C1} = 3.7$, $E_{C2} = 3.2$, $E_{C3} = 5.7$, $E_{C4} = 1.3$, Pick C3.  
(c) ans: $E_{RowPlayer} = 3.51$, $E_{ColumnPlayer} = 3.97$.

13. ans: Example of how to draw strategy lines see Example 1 in Sec 9.5 on p. 608.  
Row Players optimal strategy is pick R1 with a probability of 5/9 and R2 with a probability of 4/9.  
Column Players optimal strategy is to use probabilities of 2/9 for C1, 7/9 for C2 and 0 for C3.  
The value of the game is 37/9.

14. (a) ans: Row threatens R1, Column plays C2, threat is credible.  
Row threatens R2, Column plays C3, threat is not credible.  
Row threatens R3, Column plays C3, threat is not credible.

(b) ans: Column threatens C1, Row plays R3, threat is not credible.  
Column threatens C2, Row plays R1, threat is credible.  
Column threatens C3, Row plays R1, threat is not credible.

15. (a) ans: Row security level is 6. Column security level is 5.  
(b) ans: (R1,C1) (R1,C3), (R1,C4), (R2,C2), (R3,C1)  
(c) ans: (R2,C2), (R3,C1)  
(d) ans: (R3,C1)

16. ans: Cooper needs 15 votes to be assured of a win.

17. (a) ans: Easy Listening  
(b) ans: Jazz  
(c) ans: Jazz

18. (a) ans: June  
(b) ans: June would win a run-off  
(c) ans: June

19. 1. Ian chose Fritos and Pepperidge Farm Tahoe Cookies.  
2. Jeremy chose Pizza Combos and Oreos.  
5. Lara chose Wavy Lay’s Potato Chips and Chips Ahoy Chocolate Chip Cookies.