EXAMINATION ONE

I. Explanation, Theory, and the Scientific Method [10 points]

1. Identify the four main goals of the behavioral approach to political science. [4 points]

2. Provide an outline – in chronological order – of the five main steps of the scientific method. [5 points]

3. Why is “cause and effect“ an important part of the basic assumptions underlying science? [1 point]
II. The Logic of Science [10 points]
   1. Identify two important goals of philosophy of science? [2 points]
      
      •
      
      •

   2. Identify the two characteristics of arguments. Use these two characteristics compare and contrast inductive and deductive arguments. [4 points]

   3. Compare and contrast realism and relativism in terms what they say about the relationship between the real world and theory. [4 points]
III. Expected Value [10 points]

1. Given the following expected value model for Mutually Assured Destruction, fill in the probabilities and values. Calculate the expected value of Attack and Maintaining the Status Quo and show the conditions under which Nation B would deter Nation A. [5 points]

   ![MAD Expected Value Model Diagram]

2. Identify the major features of deductive nomological explanation. How is your answer to the previous question be viewed as a deductive nomological explanation? [5 points]
IV. Rational Choice/Public Goods [10 points]
1. Identify the five main characteristics of rational choice. [5 points]
   •
   •
   •
   •
   •

2. Identify and define the three primary characteristics of a public good. Compare and contrast the rescue fire and pig hunting in terms of the three primary characteristics of a public good. [5 points]

<table>
<thead>
<tr>
<th>Primary Characteristics and Definition of Public Good</th>
<th>Rescue Fire</th>
<th>Hunting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
V. Game Theory [10 points]

1. Fill-in the pay-offs for the following matrices [6 points]:

\[
\begin{array}{ccc}
 & C & D \\
C & & \\
D & & \\
\end{array}
\quad
\begin{array}{ccc}
 & C & D \\
C & & \\
D & & \\
\end{array}
\quad
\begin{array}{ccc}
 & C & D \\
C & & \\
D & & \\
\end{array}
\]

- **Prisoner's Dilemma**
- **Chicken**
- **Stag Hunt/Assurance**

B = Best – S = Second Best – T = Third Best – W = Worst

2. Using the pay-offs compare and contrast Chicken and Stag Hunt with the Prisoner’s Dilemma. [4 points]
IV. Using Game Theory to Explain and Understand the *Lord of the Flies* [50 points]

1. For *rescue fire* provide the following information [20 points]

   (a) Check which of the following characteristics of a public good are consistent with the rescue fire [1 points]

   - Jointness of Supply  
   - Non Feasible Exclusion  
   - Jointness of Production

(b) Fill in the following table for the rescue fire game [8 points]

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Player #1</th>
<th>Player #2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>benefit</td>
<td>cost</td>
</tr>
<tr>
<td></td>
<td>benefit</td>
<td>cost</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(c) Identify the rational strategies for both players with respect to the rescue fire. [1 point]

- Player #1 –
- Player #2 –
(d) Identify all equilibria in the game. Provide a rationale for why you believe the outcome is an equilibrium. [2 points]

- Equilibrium –

- Justification (why is it an equilibrium?) --

(e) Using the concepts from game theory and the matrix from above, provide an explanation for the rescue fire as it unfolds in the Lord of the Flies. Where possible illustrate your explanation with excerpts from the book. [4 points]

(f) Based upon your explanation, how would you respond to the follow quote from Ralph: [4 points]

I’m scared. . . not of the beast. I mean I’m scared of that too. But nobody else understands about the fire. If someone threw you a rope when you were drowning. If a doctor said take this because if you don’t you’ll die—you would, wouldn’t you?
2. For pig hunting provide the following information [20 points]
   (a) Check which of the following characteristics of a public good are consistent with pig hunting. [2 points]

   - Jointness of Supply  
   - Non Feasible Exclusion  
   - Jointness of Production

(b) Fill in the following table for the pig hunting game. [8 points]

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Player #1</th>
<th>Player #2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>benefit</td>
<td>cost</td>
</tr>
<tr>
<td>CC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(c) Identify the rational strategies for both players. Why is each strategy rational? [2 points]

- Player #1 –
- Player #2 –

(d) Identify all equilibria in the game. [1 point]
(e) Identify and discuss the inherent dilemma in the pig hunting game matrix. [1 point]

(f) Based upon the game theory matrix, provide an explanation for pig hunting as it unfolds in the Lord of the Flies. Where possible illustrate your explanation with excerpts from the book. [5 points]
3. Hunting versus Rescue Fire. [10 points]
The following 3x3 matrix presents a game theory model of cooperating on the rescue fire, defecting on both, or cooperating on hunting:

```
Player #1
C_F   D
C_F   S,S   W,B   W,W
D      B,W   T,T   S,W
C_H   W,W   W,S   B.B
```

Using the above matrix, provide an explanation for choosing Hunting over the Rescue Fire. In the course of your answer be sure to explain the following passage:

*The fire was dead. They saw that straightaway; saw what they had really known down on the beach when the smoke of home had beckoned. The fire was out, smokeless and dead; the watchers were gone. A pile of unused fuel lay ready. . . . A procession appeared, far down among the pink stones that lay near the water’s edge. Some of the boys wore black caps but otherwise they were almost naked. . . . They were chanting. . . .*

*Ralph: “You let the fire go out.”  
Jack: “We had to have them in the hunt or there wouldn’t have been enough for a ring.”  
Ralph: “I was chief, and you going to do what I said. You talk. But you can’t even build huts – then you go off hunting and let out the fire”  
Jack: “The job was too much. We needed everyone.”*