Directions: Please answer all items on this problem set. You must show all your work.

1. Given the game tree below, write out the set of strategies for each player. The $A_{ijk}$ represents the action that player $i$ can take at the $j$th node for the $k$th possible action at the $j$th node. The payoffs are written where player 1’s payoff is listed first and player 2’s payoff is listed second. The payoff represent a ranking of outcomes where lower numbers are considered better, i.e., 1 is considered the best. (10 Points)

2. For the game in question 1, what is the rollback equilibrium strategies for each player and their payoffs? Please briefly explain. (10 Points)

3. Suppose there are two players, Annie and Buck. Annie and Buck’s sinister friend puts 10 one-dollar bills on the floor. He gives each the opportunity to take either 1 or 2 dollars from the pile, one person after the other in succession. He tells them that the person who picks up the last dollar on the floor gets to take all the money the other
person has picked up, as well as, keep the money in his or her own hand. If the sinister friend chose Annie to go first, who would obtain all the money in the end? Please explain. (Hint: you may want to think of the game from the end.) (20 Points)

4. In the game discussed in question 3, does any player have an advantage? Please explain. (10 Points)

5. Given the game tree below, write out the set of strategies for each player. The Aijk represents the action that player i can take at the jth node for the kth possible action at the jth node. The payoffs are written where player 1’s payoff is listed first, player 2’s payoff is listed second, and player 3’s payoff is written third. The payoff represent a ranking of outcomes where highest numbers are considered better, i.e., 8 is considered the best. (10 Points)

6. For the game in question 5, what is the rollback equilibrium strategies for each player and their payoffs? Please briefly explain. (10 Points)