

Whitman College
Econ 328
February 7, 2013

Write all answers in your blue book. The exam ends at noon.

1. Consider the following strategic situation between two people, a mugger and a victim. The mugger first decides whether to display a gun, carry a concealed gun, or not carry a gun. If the mugger displays a gun, the victim can see it. Otherwise, the victim does not know whether the mugger is armed with a gun or not. The victim must decide whether or not to resist the mugging. If the victim resists an armed mugger, the payoffs are 3 for the mugger and 2 for the victim. If the victim resists an unarmed mugger, the payoffs are 2 for mugger and 6 for the victim. If the victim does not resist in the face of a displayed gun, the payoffs are 4 for the mugger and 5 for the victim. If the victim does not resist a mugger carrying a concealed gun, the payoffs are 5 for the mugger and 4 for the victim. If the victim does not resist an unarmed mugger, the payoffs are 6 for the mugger and 3 for the victim.

(a) (20pts) Draw the extensive form of this game. Be sure to label who plays at each decision node, what action each branch represents, and the payoff profiles at each terminal node. Clearly indicate information sets. Make your diagram large and draw it carefully.

(b) (5pts) Is this a game of perfect or imperfect information?

(c) (5pts) List the strategies in S_1 , the strategy set for player 1, the mugger.

(d) (10pts) List the strategies in S_2 , the strategy set for player 2, the victim.

(e) (5pts) Write one strategy profile for this game. What is the payoff profile associated with this strategy profile?

2. (1pt each) Indicate whether each of the statements is true or false. You do not need to explain your answer.

- (a) Any extensive form game has only one possible normal form representation.
- (b) Any normal form game has only one possible extensive form representation.
- (c) A game can have more than one dominated strategy.
- (d) A game can have no dominated strategies.
- (e) A game can have more than one dominant strategy.
- (f) A game can have no dominant strategies.
- (g) A game can have more than one dominant strategy equilibrium.
- (h) A game can have more than one Pareto Efficient outcome.
- (i) Every game has a Pareto inferior outcome.

Use Game 2 below to answer questions 3-6.

Game 2

		Player 2		
		L	M	R
Player 1	T	6, 11	5, 4	1, 2
	I	4, 2	2, 2	1, 4
	B	3, 9	6, 5	2, 2

3. Make the following calculations for Game 2. **Show all of your work.**

(a) (5pts) Consider $\theta_2 = (1/2, 0, 1/2)$. Find $u_1(I, \theta_2)$.

(b) (5pts) Consider $\sigma_1 = (3/4, 0, 1/4)$ and $\sigma_2 = (1/2, 0, 1/2)$. Find $u_2(\sigma_1, \sigma_2)$.

4. (a) (20pts) List all **dominated** strategies in Game 2. For each dominated strategy, list a strategy that dominates it.

(b) (3pts) List all **dominant** strategies in Game 2.

(c) (2pts) Does Game 2 have a dominant strategy equilibrium? If so, what is the strategy profile for the dominant strategy equilibrium?

5. (5pts) List the payoff profiles for all of the Pareto efficient outcomes of Game 2.

6. (6pts) Draw the extensive form for Game 2.