Spring 2007 – Chesnes
120 Minutes – 500 Points

Economics 414 – Final

Please answer ALL questions on this examination. Be sure to explain any non-standard notation that you use and JUSTIFY your answers. Each question's weight is shown in parentheses. Good Luck!

1. ***(35%) Simultaneous and Repeated Games.*** **Consider the following simultaneous move game (G):**

		Player 2		
		L	**C**	**R**
Player 1	**T**	**(0, 0)**	**(10, 0)**	**(3, 0)**
	M	**(1, 9)**	**(10, 10)**	**(4, 11)**
	B	**(0, 7)**	**(11, 8)**	**(5, 9)**

   a. **What strategies survive Iterated Elimination of Strictly Dominated Strategies?** ***(Do not consider mixed strategy domination.)***

   b. **Find all *pure strategy* Nash Equilibria of the game.**

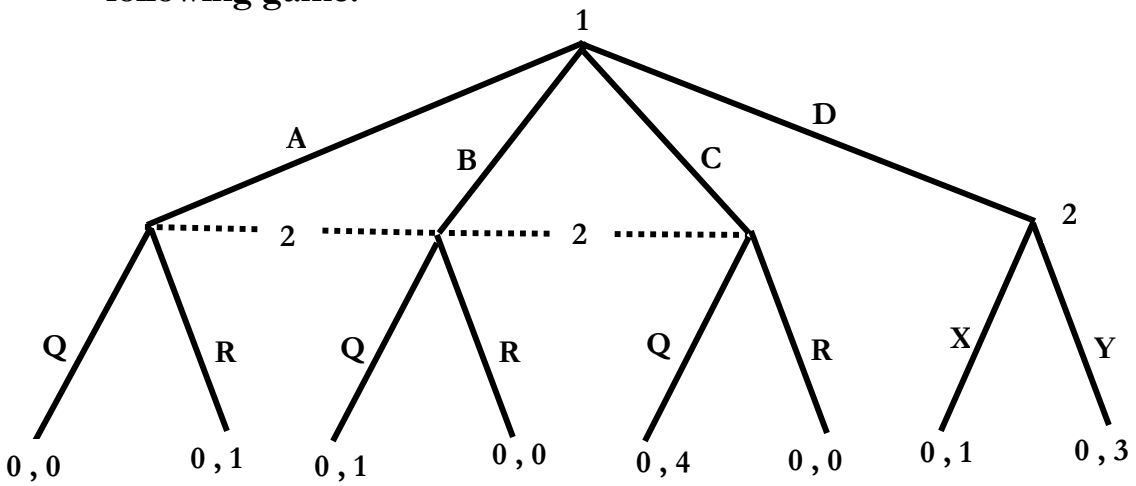
   c. **Suppose the game G is played infinitely many times and players 1 and 2 discount the future at rate δ_1 and δ_2 respectively. Write down *grim trigger* strategies that can sustain an average per period payoff of (10, 10).**

   d. **Plot the payoffs and shade the "Folk Region" on a graph.**

   e. **Solve for the critical discount factors (δ^*_1, δ^*_2) for each player such that cooperation in all periods is optimal.**

   f. **In words, explain why $\delta^*_1 < \delta^*_2$.**

2. ***(15%) Extensive game of Imperfect Information.*** **Consider the following game:**

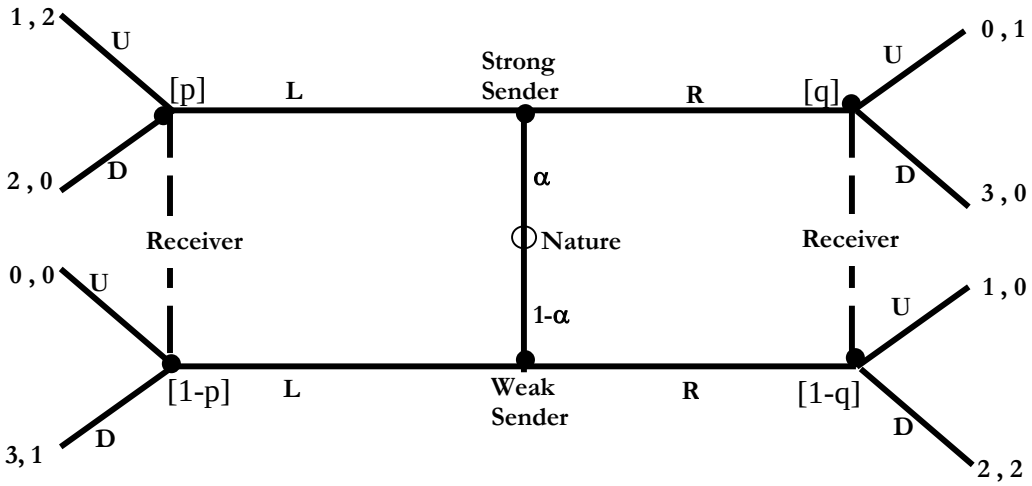


a. **How many sub-games does the above game have?**

b. **Write down the game in strategic (normal) form and solve for the *pure strategy* Nash Equilibria.**

c. **Which of the NE you solved for in part (b) are Sub-game perfect?**

3. ***(25%) Signaling.***



a. **Find the range of α such that there exists a Perfect Bayesian Equilibrium involving the strategies (R,R) and (U,D) for players 1 and 2 respectively.**

b. **Now suppose α = 0.1. Solve for a pooling PBE involving both types of senders playing L.**

c. **How many information sets do the sender and receiver have in the game above?**

4. ***(25%) Static Bertrand.*** **Consider the Bertrand model of oligopoly with 3 firms who have the following constant marginal costs:**

$$c_1 = \$1.00,\ c_2 = \$2.00, \text{ and } c_3 = \$2.00.$$

The inverse demand curve is: P(Q) = 20-Q.

a. **Solve for the Nash Equilibrium when firms can only choose prices in increments of one cent ($0.01).**

b. **Solve for the Nash Equilibrium when firms may choose** $p_i \in \Re^+ \text{ for } i = 1,2,3$ **. In other words, when there is NO smallest increment.**

c. **Now suppose firm 2's cost falls to $1.00, while everything else stays the same. Repeat parts (a) and (b) above.**