

Economics 644 – Final

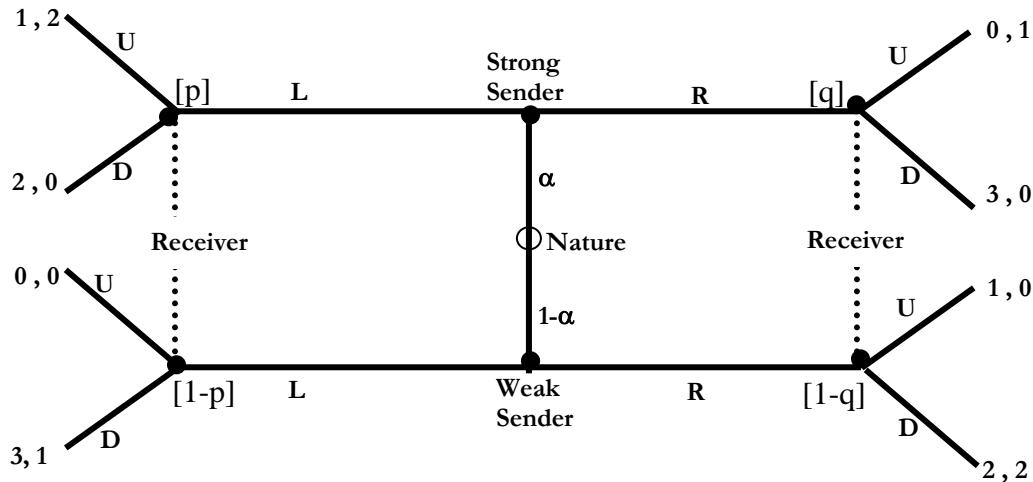
Please answer ALL questions on this examination. Be sure to explain any non-standard notation that you use and JUSTIFY your answers. Each question's weight is shown in parentheses. Good Luck!

1. *Simultaneous-Move Game (30%).* Consider the following static game:

		Player 2		
		L	C	R
Player 1		T	( 10 , 10 )	( 0 , 10 )
		B	( 30 , 20 )	( 0 , 10 )
			( 10 , 10 )	

- a. Find all pure-strategy Nash Equilibria of the game.
- b. Eliminate any strictly dominated strategies for each player if they exist. Be sure to fully explain your answer.
- c. Find all mixed-strategy Nash Equilibria of the game. Include a plot of each player's best response correspondence showing all your Nash Equilibria.

2. *Signaling (30%).*



- Find the range of  $\alpha$  such that there exists a Perfect Bayesian Equilibrium (PBE) involving the strategies  $(R, R)$  and  $(U, D)$  for the sender and receiver respectively.
- Now suppose  $\alpha = 0.2$ . Solve for a pooling PBE involving both types of sender playing  $L$ .
- How many subgames are in the game?

3. *Repeated Games (40%).* Consider the following stage game, G:

		Player 2		
		X	Y	Z
Player 1		A	(1, 1)	(0, -2)
		B	(-2, 0)	(0, 0)
		C	(-3, 10)	(1, -1)
				(5, 5)

- a. Find the pure-strategy Nash Equilibrium of the game.
- b. Write down Grim-Trigger strategies for each player to sustain (5,5) as the average per-period payoff of  $G(\infty, \delta)$ . Solve for the critical discount factor,  $\delta^*$ , such that cooperation is optimal in all periods for both players.
- c. Assume  $\delta = 0.6$  and both players play Limited-Punishment Trigger strategies with a punishment phase of  $T$  periods. If possible, determine the length of the punishment period that is required to support (5, 5) as the payoff in every stage of a sub-game perfect equilibrium. (I.e., how small can we make  $T$ , such that no player finds it optimal to deviate in any period?).
- d. Repeat part (c) but now assume  $\delta = 0.5$ . Explain your reasoning carefully.
- e. Explain the Folk Theorem and sketch the feasible payoff region and “folk region” for the game G.