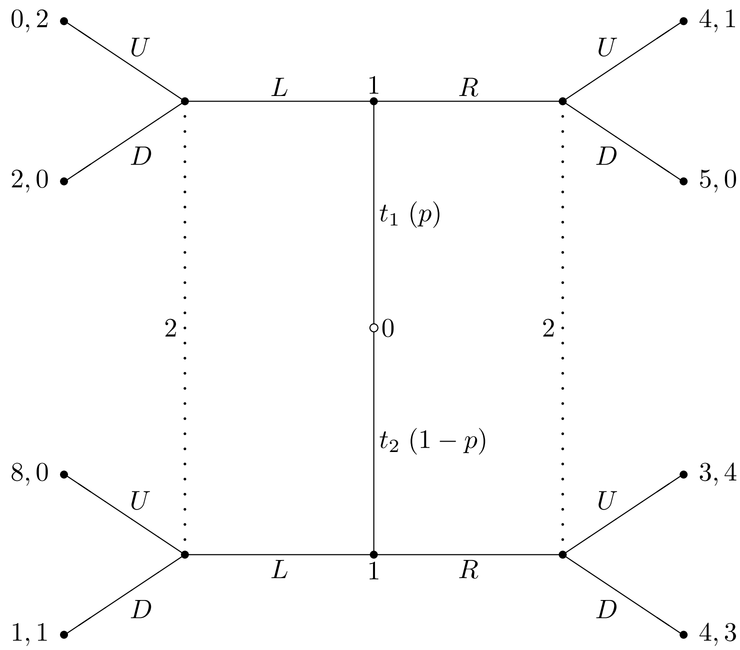
Microeconomic Theory II **Spring 2016**

Final Exam **Mikhael Shor**

Carefully explain and support your answers.

Question 1. Consider the following game. First, nature (player 0) selects t_1 with probability p, $0 < p < 1$, or t_2 with probability $1-p$. Next, player 1 selects L or R. Lastly, player 2 selects U or D.



(a) Find all pure-strategy weak Perfect Bayesian Nash equilibria of this game. Carefully explain.

(b) Which of the equilibria above satisfy the intuitive criterion? Carefully explain.

(c) How does your answer above in part (a) depend on p? Carefully explain why this is the case.

(d) Briefly discuss how and when, *in general*, the existence of some Perfect Bayesian Nash equilibria in signaling games may depend on p.

Question 2. Consider a principal-agent model in which the agent chooses between two levels of effort, $\{e_l, e_h\} = \{0, 1\}$. The principal pays the agent a wage w_s in state s and realizes output of π_s. There are four states, with the probability of a state contingent on effort given by:

effort level	π_1	π_2	π_3	π_4
$e_l(=0)$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
$e_h(=1)$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$

The agent's utility function is $\sqrt{w} - e$ and his reservation utility is $\underline{u} = 2$. The principal is risk neutral, with utility given by $\pi - w$.

(a) Compute the wage schedule that optimally implements e_h when effort is observable.

(b) Compute the wage schedule that optimally implements e_h when effort is unobservable.

(c) Consider the wage schedule $\{w_1, w_2, w_3, w_4\} = \{1, 1, 16, 36\}$. Does this wage schedule implement e_h? Does it *optimally* implement e_h? Explain.

Question 3. Consider a game consisting of two repetitions of the following stage game:

		Player 2		
		A	B	C
	X	$6, 8$	$0, 9$	$1, 3$
Player 1	Y	$2, 0$	$3, 3$	$2, 2$
	Z	$6, 2$	$2, 1$	$5, 4$

Players observe the outcome of the first stage before playing the second, with payoffs consisting of the sum of the two stages.

(a) Find the pure-strategy subgame-perfect Nash equilibrium that results in the *lowest* total payoff for the two players. Find the pure-strategy subgame-perfect Nash equilibrium that results in the *highest* total payoff for the two players.

(b) Suppose that the payoffs $(3, 3)$ from (Y, B) are replaced by $(4, 3)$. How does this change your answers above? Would you expect player 1 to benefit from this increased payoff? Briefly discuss and explain.

(c) Suppose that the payoffs $(3, 3)$ from (Y, B) are replaced by $(3, 4)$. Would you expect player 2 to benefit from this increased payoff? Briefly discuss and explain.