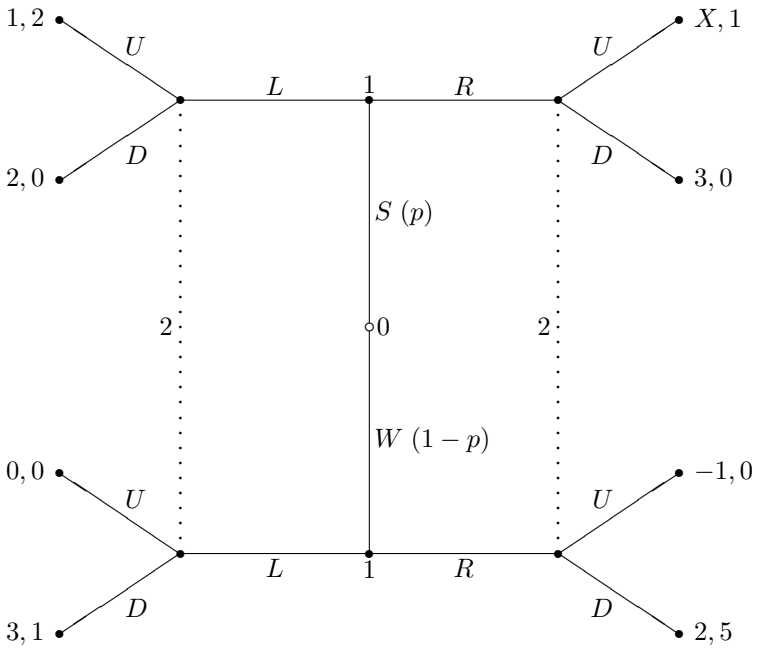
Microeconomic Theory II — Spring 2015

Final Exam — Mikhael Shor

Carefully explain and support your answers.

Question 1. Consider the following game. First, nature (player 0) selects S with probability p, $0 < p < 1$, or W with probability $1 - p$. Next, player 1 selects L or R. Lastly, player 2 selects U or D. The game has two parameters: X and p.



(a) For what values of the parameters p and X does the above game have a pooling equilibrium that includes $\{R, R\}$? Carefully demonstrate or explain.

(b) Does the pooling equilibrium above satisfy the intuitive criterion?

(c) For what values of the parameters does the above game have a separating equilibrium? What is the equilibrium?

(d) For what values of the parameters does the above game have a pooling equilibrium that includes $\{L, L\}$? Carefully demonstrate or explain.

Question 2. Consider a principal-agent model in which the agent has three levels of effort (low, medium, or high) and there are two possible outcomes (associated with profits for the principal of 180,000 and 500,000). The principal is risk neutral with utility given by profits minus wages. The agent's utility function is (of course) given by $u(w, e) = \sqrt{w} - c(e)$, and the reservation utility is 0. Wages cannot be negative. The relevant data are:

	profit		
effort level	500,000	180,000	c(e)
low	$\frac{2}{8}$	$\frac{6}{8}$	100
med	$\frac{3}{8}$	$\frac{5}{8}$	250
high	$\frac{4}{8}$	$\frac{4}{8}$	c_h

where c_h is the cost of high effort.

For what values of c_h is the principal's optimal profit the same whether or not effort is observable? Carefully explain.

Question 3. Consider a duopoly (two firm) market with inverse demand given by $P = 80 - Q = 80 - q_1 - q_2$. Each firm has marginal cost of $c = 20$.

The firms play the following two-stage game. First, the owners of the firms (who aim to maximize profits) simulatenously select managers, m_1 and m_2, where $m_i \in [0, 1]$. Second, the managers simultaneously select outputs, q_i. Manager m_i selects q_i to maximize $m_i\pi_i + (1 - m_i)R_i$ where π_i is the profit and R_i is the revenue of firm i.

1. Find the subgame perfect Nash equilibrium of this game.
2. Why is the owner asking the manager to put some weight on revenue rather than profit? Does this lead to higher or lower overall industry profits? Briefly, intuitively explain.