Advanced Microeconomic Theory II, 19.12 2016/Kultti

1. i) Two players play a game where they first play a coordination game, and then the prisoners' dilemma (given below). Determine all the equilibria.

ii) Two players play a game where they first play the prisoners' dilemma, and then a coordination game. Determine all the equilibria.

Hint: Determine first the equilibria of the stage games.

	l		r	
u	10	10	0	0
d	0	0	1	1

	c		d	
c	2	2	0	3
d	3	0	1	1

2.An individual has initial wealth w_0. In state 1 nothing happens but in state 2 the individual suffers a loss of L. The loss happens with probability π. Insurance is available at price p per unit (one unit of insurance pays one unit of money). The individual can choose how much insurance to buy. Analyse the situation in a coordinate system where the horizontal axis depicts wealth in state 1 and vertical axis depicts wealth in state 2. Denote endowment ($=$ no insurance) by $z = (w_0, w_0 - L)$. Draw the following in the coordinate system.

i) Assume that the individual buys x units of insurance. What point in the coordinate system does s/he attain? Calculate the slope of the line that connects the point and z; this is the budget line.

ii) Assume that the individual has utility function u for wealth. Express his/her expected utility in terms of $w_1$and w_2.

ii) determine the slope of his/her indifference curve at the 45-degree line.

iii) What must the price of insurance be such that the individual buys full insurance? What is the insurance company's profit at this price?

iv) Assume that there are two kinds of individuals, low-risk ones with π_l and high-risk ones with $\pi_h > \pi_l$. Determine the slopes of their indifference curves at point (w_1, w_2).

v) Show graphically that if one insurance company offers actuarially fair insurance to the high-risk types and another company to the low-risk types, then the contracts are not incentive compatible.

3. Player1 first chooses L, M or R. Player2 then chooses l or r. Player2 does not observe whether player1 chose M or R. The game is depicted below. Determine its equilibria by

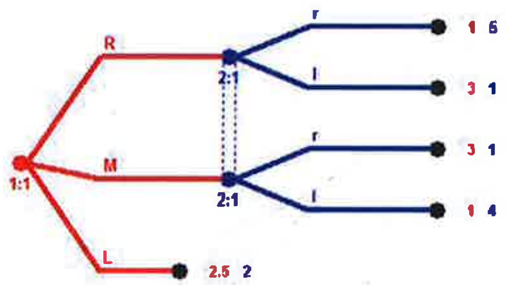
i) postulating expectations about history being M and R; history M has happened with probability p and history R with probability $1-p$.

ii) determining the values of p for which player2 chooses l, and for which s/he chooses r.

iii) showing that there cannot be an equilibrium where player1 chooses M or R with probability one.

iv) determining player1's optimal mixing if s/he has to choose between M and R.

v) figuring out the equilibrium of the whole game remembering to postulate the beliefs of player2.



4. Assume that half of the population are low-productivity workers with productivity θ_l and the other half high-productivity workers with productivity $\theta_h > \theta_l$. Workers can obtain a level of education $e \in [0, \infty)$. The cost is $c_l(e) = 3e$ for low-productivity workers and $c_h(e) = e$ for high-productivity workers. Workers are paid their expected productivity. If a worker of type $i \in \{l, h\}$ is paid w and obtains education e his/her utility is given by $w - c_i(e)$.

i) Determine the most efficient separating equilibrium. What kind of out-of-equilibrium expectations are needed to support it?

ii) Determine the most efficient pooling equilibrium. What kind of out-of-equilibrium expectations are needed to support it? Argue that this equilibrium is not reasonable.