Microeconomics 2, 18.12 2017/Kultti

Answer at most three (3) of the following problems.

1. Construct a two-player extensive form game with and infinite number of subgame perfect equilibria, such that there is also at least one Nash-equilibrium that is not subgame perfect. Specify the requested equilibria.

2.There is a risk neutral principal with a project which s/he has no time to take care of. Thus, s/he wants to employ an agent for the job. The agent's utility is given by $u(w,e) = \sqrt{w} - e^2$ where w is wage and $e \in \{e_l, e_h\}$is the effort level. The agent's outside option is worth $\underline{u} = 2$. There are two monetary outcomes x_1 and x_2, $x_2 > x_1$. The probability that x_2 is realised is given by $p_L = \frac{1}{4}$ if the agent chooses $e_l = 1$, and by $p_H = \frac{1}{2}$ if the agent chooses $e_h = 2$.

i) Assuming that the principal wants the agent to choose low effort determine the optimal contract that the principal offers the agent.

ii) Determine the maximum that the agent is willing to pay to buy the project from the principal when $x_l = 0$, $x_h = 64$.

3. Two players play an infinitely repeated version of prisoners dilemma

	c	d
c	$5,5$	$0,11$
d	$7,2$	$4,3$

Each player discounts future with factor $0 < \delta < 1$. Determine equilibrium strategies such that the players play (c,c) in each period. What is required of the discount factor?

4. Consider a signalling model where workers can acquire education. There are two types of workers: High-productivity workers are worth θ_h to the firms, and low-productivity workers worth θ_l. The cost of education, e, is given by

$$c_i(e) = \frac{2e}{2+\theta_i}$$

where $i \in \{l,h\}$. The proportion of high-productivity and low-productivity workers are equal in the population. The workers are paid their expected productivity. Determine a separating equilibrium when $\theta_h = 5.5$, $\theta_l = 2$, and the reservation utilities of the workers are $\underline{u}_h = 3$ and $\underline{u}_l = 0$.