Examination 2513 Microeconomic Analysis

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Winter 2006/2007

Instructions:

- Please answer all six questions.
- Use of non–programmable calculators is allowed.
- Please put your name on *all* sheets.
- Please hand in *all* exam materials.

Question 1

Consider the following game with imperfect information:

		Player B	
		b_1	b_2
A	a_1	2, 3	1, 1
	a_2	1, 1	2, 3

a) Find all Nash equilibria (including mixed–strategy ones).

b) Given, the players play the mixed–strategy equilibrium, what is the probability of play of each of the possible pure action profiles?

Question 2

For $s_i \in S_i$ giving the strategies by player i from his strategy set and $\pi_i(\cdot)$ giving the payoff to i, write down the (mathematical!) condition for strategy profile (s_i^*, s_{-i}^*) constituting a Nash equilibrium in the two player game between i and $-i$.

Question 3

Consider the following complex game, which consists of two parts. The first part (part I) is a game in simultaneous moves between A and B with payoffs given below

		B	
		b_1	b_2
A	a_1	8, 8	10, 6
	a_2	6, 10	part II

(part I)

In case action profile (a_2, b_2) is played, the players enter part II of the complex game, which is a simultaneous move game with payoffs given in the following table

		B	
		b_3	b_4
A	a_3	12, 12	14, 10
	a_4	10, 14	12, 12

(part II)

a) Draw the extensive form of the complete game consisting of parts I and II with A as the 'first mover'.

b) Find a subgame perfect equilibrium.

Question 4

For the game of imperfect information shown below, find *all* Nash equilibria.

		B		
		r	s	p
	r	0, 0	1, -1	-1, 1
A	s	-1, 1	0, 0	1, -1
	p	1, -1	-1, 1	0, 0

Question 5

In a model of a discrete public good with 2 players, there are two different types of Nash equilibria.
Describe both types of Nash Equilibria.

Question 6

Consider a linear version of the Tullock model of rent seeking. Strategies by player i are investment levels x_i. Payoff to i is given by

$$\pi_i = \frac{x_i}{\sum_{j=1}^{n} x_j} V - x_i,$$

where V is the value of the rent the n players are seeking.

a) Derive the individual reaction function for player i.

b) Find the (symmetric) Nash equilibrium.