Practice set 5
Strategic interaction

Industrial Economics
ICEF, HSE & UoL
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This problem set contains material for the relevant lab. Lab teachers are expected to provide sufficient guidance for the entire problem set. It is in the teacher's discretion to select the most representative tasks to solve instructionally in every lab. For the rest of the tasks, methodology, hints and final answers will be provided. Students are expected to work on practice problems, however, they are not required to submit written solutions. It is a non-negotiable policy in this course to not provide handouts with the solutions of practice problem sets.

1. Find the NE in the following simultaneous game between player 1 and player 2.

P1 \ P2	L	R
T	$x, -x$	$-x, x$
B	$-x, x$	$x, -x$

Homework 4 – 2016

2. Consider the following simultaneous game between player 1 and player 2. Specify restrictions on x, y, z so that (F,A) is the only IDE.

P1 \ P2	A	B	C
E	$x, 18$	$15, 20$	$9, y$
F	$20, 17$	$16, 16$	$8, 12$
G	$15, 9$	$z, 8$	$4, 60$

End-module 1 test – October 2015

3. There are two (and only two) profit-maximising football clubs bidding for the services of Alessandro, a star player with known capabilities. He is prepared to sell his services to the highest bidder. Each club knows that buying the player will boost demand for match tickets, both because the club will win more games and because fans will want to watch the player's skills. Suppose the demand curves (of the form $Q = a - bP$) for each club are given by the following matrix

P1 \ P2	Club 1	Club 2
With Alessandro	$10000 - 400P$	$15000 - 450P$
Without	$9000 - 550P$	$10000 - 500P$

All costs of supplying seats to fans are fixed, there are no variable costs. Which club would you expect to win the services of Alessandro, and how much would you expect him to be paid?

UoL: 2004 zb / 2011 za

4. Player 1 and player 2 simultaneously select a strategy from the following bi-matrix and immediately receive their payoffs. Then, a coin is tossed: if the coin comes heads up the game is terminated; if the coin comes tails up the same exact game is repeated. The repetition of the game will keep occurring and the players will keep accumulating payoffs till the coin comes heads up in the end of some round. Because rounds repeat instantaneously, discount is practically zero. Explain if the cooperative outcome can be sustained for $s > 10$.

P1 \ P2	L	R
T	$1, 1$	$s, 0$
B	$0, s$	$10, 10$

End-semester 1 exam – December 2015

5. Consider the following game between player 1 and player 2. (hints: Payoffs in the parentheses: Before the comma is the payoff for player 1 and after the comma the payoff for player 2. Subscripts refer to the stage).

- At stage 1, player 1 can select L_1, where the game is terminated with payoffs $(1, 1)$ or R_1 which allows player 2 to make a choice at stage 2.
- At stage 2, player 2 can select L_2, where the game is terminated with payoffs $(2, 2)$ or R_2 which allows player 1 to make a choice at stage 3.
- At stage 3, player 1 can select L_3, where the game is terminated with payoffs $(4, 1)$ or R_3 which allows player 2 to make a choice at stage 4.
- At stage 4, player 2 can select L_4, where the game is terminated with payoffs $(2, 0)$ or R_4, where the game is terminated with payoffs $(3, 2)$.

(a) What type of game is the game at hand?

(b) Name the method you have to use to solve this game.

(c) Find the equilibrium for this game.

(d) Name and define the equilibrium notion you have used in (c).

(e) In this game players move sequentially. Does the fact that player 1 moves first give him an advantage?

(f) Provide the intuition behind your answer in (e).