

## Practice problem set 6

### Static games

This problem set constitutes recommended material for the relevant lab. The choice of tasks to be presented instructionally in every lab is in the discretion of the individual teacher. Students are expected to work on practice problems, however, are not required to submit written solutions. It is non-negotiable policy in this course to not provide hand-outs 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	-1, -1	-10, 0
B	0, -10	-8, -8

*Homework 4 - 2016*

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

P1 \ P2	L	R
T	10, 7	0, 0
B	8, 8	7, 10

*Homework 4 - 2016*

3. 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*

4. 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 \	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*

5. Create a game bi-matrix in which a mixed strategy strictly dominates a pure strategy.

*End-module 1 test – October 2016*

6. 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 Alessandro	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 #5 / 2011 za #3b*

7. Assume a franchise is to be auctioned off. Market demand is  $Q = 100 - P$ , where  $Q$  is the quantity of the good demanded when the price is  $P$ . Suppose there are just two firms competing for this franchise. Firm 1's cost function is  $C_1 = 100 + q_1$  and firm 2's cost function is  $C_2 = 12q_2$ . The franchise is auctioned off using an auction where the firm offering the lowest price per unit of service wins the franchise.
- (a) Who will win the franchise and what will the winning bid be?
  - (b) Now suppose the government decides to issue the franchise to the firm that offers the largest lump sum fee to the government. An English auction is used where the firm offering the largest payment to the government wins the franchise. The franchise owner is then free to charge any price per unit. Who will win the franchise and what will the winning franchise fee be?

*UoL: 2006 za #3 / 2006 zb #6 / 2011 zb #3b*