Written Exam for the B.Sc. in Economics summer 2013

Mikro B

Final Exam

13 August 2013

(3-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by “eksamen på dansk” in brackets, you must write your exam paper in Danish.

This exam question consists of 4 pages in total including this page.

Problem 1

A newspaper columnist is highly critical of the high level of taxes in Denmark and claims the following: “Whenever we triple a tax, the harm in terms of distorting the markets is increased nine-fold”. Please comment on this claim.

Problem 2

Consider the situation where an insurance customer, by behavior that involves some effort and discomfort, is able to reduce the probability of an accident occurring. However, the insurance company cannot control which action the customer chooses once the insurance contract has been signed.

Please comment on the following statement:

“The insurance company must always design the insurance contract such that the customer is, to some extent, punished when the accident occurs, and, likewise, rewarded when it does not”.

Problem 3

In the market for artificially dyed jeans, the supply side is characterized by marginal (private) production costs being $MC(x) = x$, where x is the quantity of jeans. Demand for the good is $D(p) = Max\{300 – p, 0\}$ when the price is p.

However, the dye process causes pollution of the local river. The social (external) costs of neutralizing this is $x^2/4$ when output is x.

- 3a) What will output and price be in the jeans market (which is characterized by perfect competition)?
- 3b) Comment on the claim: “In a competitive market, the outcome will always be efficient”, illustrating the points you make in a diagram

Problem 4

Consider a risk-averse von Neumann-Morgenstern-agent with Bernoulli utility u(x) of income, where $u'(x) > 0$, $u''(x) < 0$. The agent has the income M. There is an accident probability π, $0 < \pi < 1$. The accident causes a loss of $L < M$.

The insurance company, Monopol-Insure Inc., which is risk-neutral, considers offering the agent a contract implying that the agent pays the amount Γ in both states of the world and receives the insurance sum K when the loss occurs. There are no other companies the agent can turn to; however, the agent may simply turn down the offer.

- 4a) What is the level of reservation (expected) utility for the agent?
- 4b) Specify the Lagrangian problem the insurance company need to consider in order to maximize its expected profits
- 4c) Show that the first-order-conditions will be satisfied if $K = L$
- 4d) Is the contract actuarially fair?

Problem 5:

Please present Arrow's Impossibility Theorem, including its assumptions and implications.

Problem 6:

Consider two monopolistically competing coffee sellers, Allan's Coffee and Billy's Beans, both having marginal costs of 2 $ pr. cup of coffee (for simplicity, we think of it as a continuous good).There are no fixed costs.

The demand side, students buying coffee, is described by the demand function, $D(p) = 200 - 10 \cdot p$.

- 6a) What will be the market outcome (for both of the firms: the price charged, the quantity produced, the profits earned), when they compete á la Cournot?
- 6b) Similarly, what will the market outcome be, when they compete á la Bertrand?
- 6c) What happens in the Cournot case if Billy has marginal costs of 5 $?