Written Exam for the B.Sc. in Economics Summer 2010

Micro B, 2nd year

Final Exam

16 August, 2010

(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.

If you are in doubt about which title you registered for, please see the print of your exam registration from the students' self-service system.

1

Give a brief description of the Second Best Theorem.

2

In an economy with two consumers, there is a private good which can be transformed into a public good; it costs one unit of the private good to produce one unit of the public good. The consumers' preferences are represented by utility functions $u_A(G,x_A) = 3\cdot G^{½} + x_A$ and $u_B(G,x_B) = 5\cdot G^{½} + x_B$, when G is the quantity of the public good, and x symbolizes the quantities of the private good.

Identify the Pareto-Optimal level of the public good. Why does this level not depend on the initial distribution of wealth?

In a Lindahl equilibrium with this quantity of the public good being produced, what will the individual prices for the two consumers be?

3

Arrow considered the problem of finding a good way to aggregate individual preferences into "society's preferences". He gave three conditions for this aggregative procedure, when each individual has a preference relation which is a total pre-order (total, reflexive, and transitive):

- Society's preferences should be a total pre-order
- If all individuals prefer x to y, so should society (the so-called Pareto Principle)
- Society's ordering of x and y should depend only on individual orderings of x and y, and not depend on other, irrelevant alternatives (Principle of Irrelevant Alternatives)

It is obvious to suggest the use of majority voting: If a majority of individuals prefer x over y, society's preferences should be that x is preferred over y.

Which of the above conditions does this "aggregative procedure" fulfill, and which not?

4

Consider an Edgeworth economy in which there are two consumers, A and B. There are two goods, and each agent must consume a non-negative quantity of each of these goods. The agents have the utility functions functions $u_A(x_{1A}, x_{2A}) = 2\cdot x_{1A} + x_{2A}$ and $u_B(x_{1B}, x_{2B}) = x_{1B} + 2\cdot x_{2B}$. The initial resources are: (5,5), i.e. five units of each of the goods, 1 and 2.

Show that the Utility Possibility Set can be described as the set of (u_A , u_B) in the non-negative orthant of R^2 satisfying:

For $0 \leq u_A \leq 10$: $0 \leq u_B \leq 15 - ½\cdot u_A$

For $10 \leq u_A \leq 15$: $0 \leq u_B \leq 30 - 2\cdot u_A$

Using the Social Welfare Function $W(u_A , u_B) = 3 \cdot u_A + u_B$, find the allocation that maximizes this function.

Do the same using the Social Welfare Function $V(u_A , u_B) = u_A + 3 \cdot u_B$, and comment.

5

Give a brief description of Pigouvian taxes.

6

Peterson's Paint Factory is the only employer in town. It hires employees from the local area, who constitute the inverse labor supply curve w(L), w'(L) > 0. Explain how the factory determines the number of employees it hires, illustrate this in a diagram and point out any efficiency problems.

Ref.: mtn, 21 May 2010