

Written Exam for the B.Sc. or M.Sc. in Economics winter 2014-15

**Mikroøkonomi A**

Final Exam

January 2015

(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 3 pages in total**

### Problem 1

Please provide three different diagrams (a, b, and c) depicting indifference curves, each characterizing a consumer who has preferences which are

- a) Monotonically increasing, and convex
- b) Convex, but not monotonically increasing
- c) Monotonically increasing, but not convex

### Problem 2

Danny is a student consuming food (good 1) and entertainment (good 2), both in continuous, non-negative quantities. Danny's preferences can be represented by the utility function  $u(x_1, x_2) = x_1 \cdot x_2$ . Danny has an exogenous income in the form of a 400 \$ stipend. Initially, the price of food is 2, and the price of entertainment is also 2.

- a) Identify the utility-maximizing consumption plan for Danny

The government, in an attempt to make students follow a healthier life-style, taxes the entertainment good heavily, hence increasing its price to 8.

- b) Identify the utility-maximizing consumption plan for Danny after the tax has been introduced
- c) How much of the change in his consumption can be ascribed to the substitution effect, and how much to the income effect (using the concept of Hicks compensation, not Slutsky)?

### Problem 3

Define the concept of “endowment effect” of a price change on the behavior of consumers, and provide some examples of how it may yield results that at first seem counter-intuitive.

### Problem 4

Consider the firm ToyFun producing toys for children, selling to a market characterized by perfect competition. It does so using two inputs both of which can be used in continuous, non-negative quantities:

- Labor, the quantity of which can be changed in the short run
- Capital, the quantity of which can only be changed in the long run.

ToyFun's production function is given by  $y = L^{1/2} \cdot K^{1/2}$ . At the moment, the firm has a fixed quantity of capital which is 64, and it faces a wage rate of 4, whereas the rental price for capital is 9. The price of toys is  $p$ .

- a) Please identify the firm's short run supply curve, expressing this mathematically as well as in a clear diagram
- b) What happens to the short run supply curve if the wage rate increases to 9?

- c) Please identify the firm's long run supply curve, at wage rate 4, expressing this mathematically as well as in a clear diagram

### Problem 5

Consider the two Welfare Theorems, the first saying that under certain assumptions, concerning the preferences of consumers and production sets of firms, an allocation belonging to a Walrasian equilibrium will be efficient; the second saying that under certain (other) assumptions, an efficient allocation may be implemented as an allocation belonging to a Market equilibrium with transfers.

- a) Please state which assumptions are needed for the First Welfare Theorem
- b) Please state which assumptions are needed for the Second Welfare Theorem
- c) Provide some intuition for your answers in a) and b)

### Problem 6

Consider an Edgeworth economy with two consumers, Alice and Betty, having the utility functions,  $u_A(x_{1A}, x_{2A}) = x_{1A} \cdot x_{2A}$  and  $u_B(x_{1B}, x_{2B}) = 5 \cdot \ln(x_{1B}) + x_{2B}$ . Good 1 is food, and good 2 is drinks, and both can be consumed in continuous, non-negative quantities (Betty, however, must have a positive quantity of food). The total initial endowment is (60, 60). It is a private ownership economy in which Alice initially owns (20, 40) and Betty initially owns (40, 20).

- a) Identify the Walrasian equilibrium, including the equilibrium value of the price of good 1 (using good 2 as numeraire), and the trades taking place between the two agents
- b) What would happen with the equilibrium price if Alice owned a little more of good 1, and Betty owned a little less?