Written Exam for the B.Sc. in Economics summer 2014

Microeconomics A

Final Exam

05/06/2014

(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

Consider a consumer, Anna, who is fond of pizza (good 1) and diet soda (good 2). Each month she spends an amount of dkk 300 on pizza and soda altogether. Her preferences on pizza and diet soda are representable by a utility function $u(x_1, x_2) = x_1^2 x_2$. Initially, one pizza costs dkk 40 while one diet soda costs dkk 20. To improve public health the government imposes a tax of dkk 10 per pizza to reduce the fat intake.

  a) How much would Anna be willing to pay in order to prevent a tax on pizzas before the price change?
  b) What is the efficiency loss of this tax? Explain why the efficiency loss occurs.

Problem 2

Consider a market where there are two types of consumers, *students* who consume beers and other goods, with a utility function $u_S(x_1, x_2) = 4\sqrt{x_1} + x_2$ and *other people* who have a utility function $u_O(x_1, x_2) = 2\sqrt{x_1} + x_2$, where x_1 is the amount of beers enjoyed by a consumer and x_2 all other goods.
A student has income only from SU which amounts to $I_S = 20$, while the *other people* has an income of $I_O = 100$. Normalize the price of other goods to unity, $p_2 = 1$.

The breweries can produce beer at a fixed marginal costs, $MC = 2$, and endures no fixed nor quasi-fixed costs.

  a) Derive the individual demand functions for beer and the aggregate demand function.
  b) Find the price and quantity of beers in equilibrium.
  c) What happens to the equilibrium in the beer market if the government increases the SU to $I_S = 30$? Explain your result.

Problem 3

Consider a company, *PølseKompagniet Hansen & Søn A/S*, which produces sausages to be consumed for lunch and breakfast. The company uses a technology with the production tion $f(\ell, k) = \ell^{\frac{1}{2}} k^{\frac{1}{4}}$. Each sausage can be sold at a price of $p = 2$, the wage rate is $w = 1$ and the rental rate is $r = 1$.

  a) Determine the profit maximizing production plan of *Pølsekompagniet A/S*, when the firm is tied up on a contract of the capital level at $\bar{k} = 1$.

Assume that Niels Henning, the chief engineer of *PølseKompagniet A/S*, invents some ingenious new technology for sausage production. This enables them to produce twice as many sausages with the same amount of input as before, which means that the new production function becomes $g(\ell, k) = 2\ell^{\frac{1}{2}} k^{\frac{1}{4}}$.

  b) What is the effect on the firm's profit after this invention? Comment on the effect.

Problem 4

Comment on the following statement:

"A competitive firm will always produce such that the marginal costs exactly equal the market price, whenever the price exceeds the total average costs."

Problem 5

Consider two consumers, Karen and Jørgen, who each live in the same two periods: "today" and "tomorrow". In each period they can consume the same aggregate consumption good, and denote by c_1 the consumption today and c_2 the consumption tomorrow, and a pair $c = (c_1, c_2)$ is called a consumption plan. Karen has preferences on consumption plans given by $u_K(c_{1K}, c_{2K}) = c_{1K}c_{2K}$ while Jørgen has a utility function given by $u_J(c_{1J}, c_{2J}) = \min\{c_{1J}, c_{2J}\}$.

Karen has more income today than tomorrow, while Jørgen has less income today than tomorrow. Thus, Karen has an initial endowment of $e_K = (4,0)$, while Jørgen has an initial endowment of $e_J = (1,5)$.

    a) Determine the Walras equilibrium of this economy with the price of consumption tomorrow normalized $p_2 = 1$.

    b) Determine the equilibrium interest rate, and the savings of both Karen and Jørgen.

Assume alternatively that Jørgen instead of the above utility function had a utility function given by $\tilde{u}_J(c_{1J}, c_{2J}) = \min\{c_{1J}, 2c_{2J}\}$.

    c) Determine the Walras equilibrium of this economy with the price of consumption tomorrow normalized $p_2 = 1$. Compare with your result in a) and explain.