Written Exam for the B.Sc. in Economics summer 2015

Microeconomics A

Final Exam

8. June 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

True or false? In each case explain your answer.

1) The marginal rate of substitution of a consumer measures the change in utility from consuming proportionally more of every good.

2) A consumer with rational and monotone preferences will always spend his or her entire budget.

3) A firm will choose to hire labour such that the market value of the marginal product of labour equals the wage rate.

4) A consumer with rational, monotone and convex preferences will always buy more of a good if his/her income increases.

Problem 2

Consider a consumer, Gerda, with rational, strictly monotone and convex preferences, representable by a utility function, $u_G(x_1, x_2)$. She can buy goods at the prices $p = (p_1, p_2) \gg 0$ and she has a fixed income of $I > 0$. At the going prices she will consume a strictly positive amount of both goods.

The government has proposed to levy a per-unit tax $t > 0$ on good 1.

1) Can we be sure that Gerda will decrease her consumption of good 1?
2) If Gerda has the utility function $u_G(x_1, x_2) = \ln x_1 + x_2$, what is the effect of the tax the her demand for good 1 (find $\frac{\partial x_1(p_1,p_2,I)}{\partial t}$)? (Assume, for simplicity, that her income is sufficient to ensure she is consuming strictly positive quantities of each of the two goods).

An economic consultant hired by the government, however, suggests that the tax instead should be in the form of a lump-sum tax.

3) Explain and/or illustrate why you as an economist would prefer the lump sum tax. Explain the concept of a dead-weight loss.
4) Derive the dead-weight loss in the case the Gerda has the utility function in question 2) and if prices are $p = (1,1)$, tax rate $t = 1$ and Gerda's income is $I = 20$.

Problem 3

Heinrich is a consumer that has a utility function $u(f, c) = f \cdot \sqrt{c}$ in a Koopmans economy, in which the production technology is given by $y = 2\sqrt{l}$. Heinrich owns no initial amount of the consumption good, but has 12 hours to use either for labour or leisure time.

1) Find the Pareto efficient allocation of this economy.

2) What is the Walrasian equilibrium when Heinrich fully owns the firm?

Problem 4

A farmer produces pigs for export by using labour, l, and capital, k, using the production function $y = f(l, k) = \min\{2l, k\}$. The farmer can hire labour at the wage rate $w > 0$ and capital at a rental rate of $r > 0$. He exports the pigs on the world market where he can sell each pig at the price $p > 0$.

1) Derive the cost function in the long run.
2) Derive the long-run supply function of the farmer.

Problem 5

Viggo lives in two periods and consumes a consumption good in both periods, we denote by c_1 his consumption today and c_2 his consumption tomorrow. He earns income today of $e_1 > 0$ but nothing tomorrow. He can borrow or lend at an interest rate of r. Viggo obtains utility in the form of $u(c_1, c_2) = \ln c_1 + 2 \ln c_2$.

1) Show that Viggo can choose any consumption plan (c_1, c_2) that satisfies $c_1 + \frac{c_2}{1+r} = e_1$
2) Derive the saving function $s(r, e_1)$
3) How will Viggo's utility be affected by an increase in the interest rate? Explain.