



Stockholm
University

Department of Economics

Course name: Intermediate Microeconomics
Course code: EC2101
Semester: Autumn 2015
Type of exam: Main
Examiner: Hans Wijkander
Number of credits: 7,5 credits (hp)
Date of exam: Sunday, October 25, 2015
Examination time: 5 hours (09:00-14:00)

Write your exam identification number on each paper and cover sheet (the number stated in the upper right hand corner on your exam cover).

Use one cover sheet per question. Explain notions/concepts and symbols. If you think that a question is vaguely formulated or ambiguous, specify the conditions used for solving it. Only legible exams will be marked. **No aids are allowed.**

You may give your answers in either English or Swedish, but not both, please use the corresponding cover sheet(s) to indicate which language you provide your answers in.

The exam consists of 4 questions, 100 points in total. **Indicative information about grades:** for the grade E 45 points are required, for D 50 points, C 60 points, B 75 points and A 90 points.

Your results will be made available on your "My Studies" account (www.mitt.su.se) on the 16th of November at the latest. The date and time for the exam review session will be shown on your schedule after this exam has been held.

Good luck!

1. **(25 points)**. Consider a worker who splits her 24 hours per day into working time and leisure time. The worker has a utility function over the consumption good and leisure time, $U = C^{\frac{1}{2}} S^{\frac{1}{2}}$, where C represents consumption goods and S represents leisure time. Work gives the worker disutility. When she works she gets SEK w per hour worked. The worker has no non-labor income. The income she gets is spent on the consumer good C . The price of the consumer good is SEK 1 per unit.
 - a) Formulate the worker's maximization problem. (5 points)
 - b) Write the Lagrange function for the maximization problem. (5 points)
 - c) State (write) the first order conditions for maximum utility the worker can obtain. (5 points)
 - d) Derive the worker's labor supply function. (5 points)
 - e) Suppose both consumption of consumer goods and leisure time are normal goods. How does the income effect, affect labor supply when the hourly wage rate increases? (5 points)

2. **(25 points)**. The firm Clever produces gadgets (y) using labor (L) and capital (K). The production technology is: $y = L^{0.5} K^{0.5}$.
 - a) What degree of returns to scale does Clever's production technology show? (5 points)
 - b) Derive the marginal productivity of labor and capital. (5 points)
 - c) Are marginal productivities increasing, constant or decreasing? (5 points)
 - d) Derive Clever's cost function (let w and r be prices of labor and capital, respectively). (5 points)
 - e) Suppose the wage rate is 4 and the price of capital 9, what is the cost of producing 2 units of gadgets? (5 points)

3. **(25 points)**. The firm Smart produces stuff. It is the only producer of stuff implying that it has monopoly on stuff production. The inverse demand function Smart faces is $p = 10 - 2Q$ where the price of stuff is p and Q is the quantity of stuff sold on the market.
 - a) State Smart's marginal revenue function. (5 points)
 - b) Suppose Smart's marginal cost for producing stuff is 2. What is the profit maximizing quantity of stuff produced and sold by Smart and at which price does Smart sell stuff? (5 points)
 - c) Suppose that the firm Tricky considers entering the market. The aggregate production in that case is: $Q_S + Q_T$, where Q_S is the quantity of stuff sold by Smart and Q_T is the quantity sold by Tricky. Tricky's marginal cost for producing stuff is 3. The two firms act simultaneously. How much does each firm produce and sell? (5 points)
 - d) What is the market price of stuff after Tricky has entered the market? (5 points)
 - e) Suppose Tricky has to make an initial investment of 3 to enter the market. Would Tricky then enter the market? Motivate your answer. (5 points)

4. **(25 points)**. Buying a used car is difficult because you may rightly assume that the seller has got more and better information about the car than you have. You don't know if the seller sells the car because it is on the brink of being scrapped or requiring extensive repairs, or it may be because the seller doesn't need the car, although it is good.
- a) What does one call the type of asymmetric information as the one described above? (5 points)
 - b) Suppose there are a very large number of potential buyers and there are 500 sellers of bad cars valued to SEK 10.000 each by buyers and 500 sellers of excellent cars valued to SEK 50.000 by buyers. Sellers of bad cars are prepared to sell for SEK 7.000 and sellers of excellent cars sell for SEK 25.000. What would the market price of a used car be if buyers can't distinguish between bad and good cars? Assume car buyers are risk neutral and that they know the distribution of bad and good cars. (5 points)
 - c) How would the outcome (number of cars sold and market price) of the market change if there were 800 bad cars and only 200 excellent cars? (5 points)
 - d) Is the market outcome in the c part of the question efficient? Motivate your answer. (5 points)
 - e) Suppose the distribution bad/excellent cars is 800/200 and sellers of excellent cars can buy a certificate for SEK 20.000 (rather expensive isn't it) that establishes without doubt that the car is excellent. Would a seller of an excellent car buy the certificate? (5 points)