



YLIOPISTOTENTTILOMAKEPOHJA / UNIVERSITY EXAM TEMPLATE

Koskee tiedekuntia LuTK, OyKKK, KaTK, TTK, TST ja BMTK (Linnanmaan tentit) /
Concerns Faculties SCI, OBS, OMS, TECH, ITEE and BMM (Linnanmaa campus)

Tentin päivämäärä / Date of exam: 2.11.2015	Tentin kesto tunteina / Exam in hours: 4h
Tiedekunta / Faculty: Oulun yliopiston kauppakorkeakoulu / Oulu Business School	
Opintojakson koodi, nimi ja tentin numero / The code and the name of the course and number of the exam: 721345S, Intermediate Microeconomics, 1st Exam	
Tentaattori(t) / Examiner(s): Enni Ruokamo, Hannu Huuki	Sisäinen postios. / Internal address 60yKKK
Sallitut apuvälineet / The devices allowed in the exam:	
<input checked="" type="checkbox"/> Nelilaskin / Standard calculator	<input checked="" type="checkbox"/> Funktiolaskin / Scientific calculator
<input type="checkbox"/> Ohjelmoitava laskin / Programmable calculator	
<input type="checkbox"/> Muu materiaali, tarkennettu alla / Other material, specified below:	
Tenttiin vastaaminen / Please answer the questions:	
<input checked="" type="checkbox"/> Suomeksi / in Finnish	<input checked="" type="checkbox"/> Englanniksi / in English
Kysymyspaperi on palautettava / Paper with exam questions must be returned:	
<input checked="" type="checkbox"/> Kyllä / Yes	<input type="checkbox"/> Ei / No

Answer to all 5 questions.

1.

Consider the following statements if they are true or false. Verify your answers briefly. In order to get the credit from the correct answer the explanation is needed.

- a) Reflexivity assumption for preferences indicates that indifference curves can never intersect. 1p
- b) An inferior good is a good that decreases in demand as the price decreases. 1p
- c) A bond paying 1000€ each year forever with an annual discount rate of 5% has a present value of 5000€. 1p
- d) If firm has a production function of the form $y = f(x_1, x_2) = x_1^{0.5}x_2^{0.5}$, where x_i is the amount of input i and y is the amount of output, it exhibits constant returns to scale. 1p
- e) Average fixed costs never increase when output increases. 1p
- f) Adverse selection refers to a situation where one side of the market can't observe the actions of the other side. 1p

2.

Consumer has Cobb-Douglas preferences: $U(x_1, x_2) = x_1^2 x_2$,
where x_1 and x_2 are the amounts of consumed goods 1 and 2.

The price of good 1 is $p_1 = 1$ and the price of good 2 is $p_2 = 2$. Consumer's income is $m = 24$.

- a) Write down the budget constraint. What is the slope of the budget line? 1p
- b) What does the marginal rate of substitution (MRS) measure? Calculate the marginal rate of substitution for the consumer. 2p
- c) Derive the utility-maximizing ordinary demands $x_1^*(p_1, p_2, m)$ and $x_2^*(p_1, p_2, m)$, given the prices of the goods and the consumer's income. 2p
- d) Does the utility function $V(x_1, x_2) = 2\ln(x_1) + \ln(x_2)$ represent the same preferences as $U(x_1, x_2)$?
Explain. 1p

3.

Jimmy has utility function $U(m) = \sqrt{m}$ over his income m .

- a) What are Jimmy's preferences towards risk. Is he risk loving, risk averse or risk neutral? Explain your answer by studying the shape of the utility function analytically and/or graphically. 3p

Jimmy drives to city center every day, and has to spend money on parking meter. Jimmy's daily income is 100€. Parking for one day costs 9,75€. If he does not pay for the parking time, he knows there is a probability π of being caught in a given day. The fine for cheating is 51€.

- b) What is Jimmy's expected utility if he pays for the one day parking? 1p
c) Write down Jimmy's expected utility function if he does not pay for the parking, i.e. if Jimmy takes the "parking risk". 1p
d) Assume that Jimmy is an expected utility maximizer. Solve the probability of being caught π , that would make Jimmy indifferent between paying for parking and taking the risk. 1p

4.

Market demand curve is $D(p) = 300 - p$.

Market supply curve is $S(p) = 0.5p - 30$.

- a) Write down inverse demand function $P_D(q)$ and inverse supply function $P_S(q)$. 1p
b) Solve equilibrium quantity q^* and equilibrium price p^* . 1p
c) Calculate consumer surplus (CS^*) and producer surplus (PS^*). 1p
d) Government imposes quantity tax $t=18€$ on sellers. Solve the new market equilibrium quantity q^t and price p^t . 1p
e) Calculate tax revenue, consumer surplus (CS^t) and producer surplus (PS^t) after the tax. 1p
f) Solve the deadweight loss of the tax. 1p

5.

Aggregate market demand for milk is given by $q(p) = 50 - (p/2)$, where q is the amount of milk and p is the market price. The total cost function for any firm in the industry is $c(q) = 4q$.

- a) Assume that there is only one milk firm in the market.
Write down the monopoly's profit function $\pi(q)$.
What is the profit maximizing level of output q^m for the monopolist?
What would be the market price? 2p
- b) Assume there are two Cournot firms (i.e. quantity competition) operating in the market.
What would be the reaction functions $R_1(q_2)$ and $R_2(q_1)$?
What would be the Cournot-Nash equilibrium quantities q_1^* and q_2^* ?
What would be the market price? 2p
- c) Assume there are two Bertrand firms (i.e. price competition) operating in the market.
What would be the equilibrium prices p_1^B and p_2^B ? Explain.
What would be the market demand? 2p

