

YLIOPISTOTENTTI - UNIVERSITY EXAM

Opiskelijan nimi / Student name:	Opiskelijanumero / Student number:
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Opintojakson koodi and nimi / The code and the name of the course: 721345S Intermediate Microeconomics	
Tiedekunta / Faculty: Oulun yliopiston kauppakorkeakoulu / Oulu Business School	
Tentin pvm / Date of exam: 16.1.2017	Tentin kesto tunteina / Exam in hours: 3
Tentin nro / No. of the exam: 3rd exam	Opintopistemäärä / Credit units: 6
Tentaattori(t) / Examiner(s): Juha Teirilä	Sisäinen postios. / Internal address: 6 OyKKK
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 Suomenkielisessä tutkinto-ohjelmassa olevalla opiskelijalla on oikeus käyttää arvioitavassa opintosuorituksessa suomen kieltä, vaikka opintojakson opetuskieli olisi englanti. Tämä ei koske vieraan kielen opintoja. (Kts. <u>Koulutuksen johtosääntö 18 §</u>) In a Finnish degree programme a student has a right to use Finnish language for their study attainment, even though the language of instruction is English, (excluding language studies) even when the language of instruction is other than Finnish. (See the <u>Education Regulations 18 §</u>)	
Kysymyspaperi on palautettava / Paper with exam questions must be returned: <input checked="" type="checkbox"/> Kyllä / Yes <input type="checkbox"/> Ei / No	

Please answer all 5 questions (6 points each).

Question 1.

Paul enjoys commodities x and y according to the utility function

$$U(x, y) = x^2 + y^2.$$

The prices of the commodities are $p_x = 3$ € and $p_y = 4$ €. Paul has $m = 50$ € to spend.

- a) Write down Paul's budget constraint. What is the slope of the budget line?
- b) What does the marginal rate of substitution (MRS) measure? Calculate the marginal rate of substitution for Paul.
- c) Which affordable consumption bundle (x^*, y^*) maximizes Paul's utility?
- d) Draw some of Paul's indifference curves and his budget constraint. Mark also the optimal consumption bundle. Did you find the true maximum?
- e) How would you describe Paul's preferences?

Question 2.

- a) What is meant by (an own) price elasticity of demand? Write down the formula how to calculate it given a demand function.
- b) What is meant by an externality in economics? Give one example of positive externality and one example of negative externality.
- c) Define an equilibrium concept in a Cournot game (i.e. What do the players decide? How do they make their decisions?). How does it differ from a Stackelberg game?

Question 3.

Suppose the demand curve $D(p)$ and the supply curve $S(p)$ for the market are given by the following equations:

$$\begin{aligned} D(p) &= 75 \\ S(p) &= p - 10 \end{aligned}$$

- a) What is the market equilibrium (price and quantity) in this market? Calculate the producer surplus.
- b) Suppose that the government imposes a quantity tax $t = 5$ on firms. Solve the new market equilibrium. What happens to the producer surplus? Draw a figure.
- c) Calculate the tax revenue. Who ends up paying the tax? Does the consumer surplus change? If yes how much?

Question 4.

Suppose the production function is the following Cobb-Douglas form: $f(x_1, x_2) = x_1^{1/3} x_2^{2/3}$.

- a) What are the marginal products of factors 1 and 2? Are they diminishing, constant or increasing?
- b) Solve the technical rate of substitution. What does TRS measure?
- c) What kind of returns to scale does this technology represent?

Question 5.

Demand for a specific medicine is given by equation: $q = 250 - 2,5p$, where q is quantity and p is price. The total cost of production is given by the equation: $C(q) = 0,1q^2 + 500$. The medicine is patented and can be produced by one firm only.

- a) Write down the inverse demand function $p(q)$?
- b) Write down the monopoly's profit function $\pi(q)$.
- c) What is the profit maximizing output q^m for the monopoly?
What is the profit maximizing price $p(q^m)$?
At what level are the marginal costs $MC(q^m)$?
- d) What causes the inefficiency in monopoly market outcome? How does the results in part c) reflect this?

