

YLIOPISTOTENTTI - UNIVERSITY EXAM

Opiskelijan nimi / Student name:	Opiskelijanumero / Student number:
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Opettaja täyttää / Lecturer fills in:

Opintojakson koodi and nimi / The code and the name of the course: 721320S ECONOMIC THEORY I	
Tiedekunta / Faculty: Oulu Business School	
Tentin pvm / Date of exam: 25.8.2017	Tentin kesto tunteina / Exam in hours: 3
Tentin nro / No. of the exam: Summer exam	Opintopistemäärä / Credit units: 6
Tentaattori(t) / Examiner(s): Professor (acting) Jaakko Simonen	Sisäinen postios. / Internal address: OyKKK
Sallitut apuvälineet / The devices allowed in the exam: <input 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 <p>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</u> 18 §)</p> <p>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 <u>the Education Regulations</u> 18 §)</p>	
Kysymyspaperi on palautettava / Paper with exam questions must be returned: <input checked="" type="checkbox"/> Kyllä / Yes <input type="checkbox"/> Ei / No	

Important ! You can choose to answer question 1 or 2, not both! Questions 3 - 5 are for everyone. In total you can answer to 4 questions.

1. a) Describe graphically consumer's utility optimisation problem in a general level in X_1, X_2 -space. (You can assume the Cobb-Douglas utility function). (2 points)

b) Suppose that consumer has a utility function $u(x_1, x_2) = x_1^a x_2^{1-a}$ where $X_1 > 0, X_2 > 0$ and a is positive parameter $0 < a < 1$. Budget constraint is $m = p_1 x_1 + p_2 x_2$. Use this information to calculate:

- Marshallian demand functions
- Hicksian demand functions

(4 points)

2. We can use compensating variation, equivalent variation and consumer surplus to measure how much consumer's welfare will change after the price change. Explain carefully what these concepts mean. Use figures to describe the difference of these concepts in a case of two normal goods. *You don't have to calculate anything!* (6 points)

3. Consider a duopoly with identical firms. Cost function for firm f is $C^f(q^f) = C_0 + cq^f$, $f = 1, 2$. Inverse demand function of the market is $p = \beta_0 - \beta q$. Total output is given by $q = q^1 + q^2$. C_0, c, β_0 and β are all positive numbers.

a) Solve Cournot -Nash equilibrium, when firms make decisions over their output quantities simultaneously. What are the firms' outputs and profits in the equilibrium? Draw figure (in q^1, q^2 - space) to clarify and enliven your answer. Explain shortly its content.

b) Let's assume that firms form a cartel. How much each firm produces and what are their profits? Illustrate solution in the figure that you draw in point a.

c) Find so called Stackelberg solution. How much firms produce and what are their profits? Illustrate solution in the figure that you draw in point a. You can define that firm 1 is a leader and firm 2 is a follower. Compare the results that you got in points a - c.

(6 points)

4. a) Use Edgeworth box to describe the competitive equilibrium of the exchange economy in a case of two individuals (who have convex preferences) and two commodities. Draw a figure and explain its content carefully. Define Walras' law, contract curve and core of economy. (2 points)

b) There are two commodities and two individuals in an exchange economy. These individuals have their utility functions as follows

$$U^a(x^a) = \ln(x_1^a) + 2\ln(x_2^a),$$

$$U^b(x^b) = 2\ln(x_1^b) + \ln(x_2^b)$$

where x_i^h is the consumption by agent h of good i, $h=a,b$ and $i=1,2$. The endowments are

$$R^a = (9,3) \text{ and } R^b = (12,6).$$

- Obtain the excess demand functions for each good and verify that Walras' Law is true.
- Find the equilibrium price ratio.
- What is the equilibrium allocation?

(4 points)

5. Explain shortly what following concepts mean (draw figures to clarify and enliven your answer).

- a) Risk-averse
- b) Risk-loving
- c) The index of absolute risk aversion
- d) Constant relative risk aversion
- e) Certainty equivalent
- f) Risk premium

(6 points)

