

## YLEISEN TENTIN TENTTILOMAKE - GENERAL EXAM FORM

Opiskelija täyttää / Student fills in

<b>Opiskelijan nimi / Student name:</b> Click here to enter text.	<b>Opiskelijanumero / Student number:</b> Click here to enter text.
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Opettaja täyttää / Lecturer fills in

<b>Opintojakson koodi / The code of the course:</b> 721320S	
<b>Opintojakson (tentin) nimi / The name of the course or exam:</b> ECONOMIC THEORY I	
<b>Opintopistemäärä / Credit units:</b> 6  Mikäli kyseessä on välikoe, opintopistemääräksi täytetään 0 op. 0 ECTS Credits is used for mid-term exams.	
<b>Tiedekunta / Faculty:</b> Oulu Business School	
<b>Tentin pvm / Date of exam:</b> 27.2.2019	<b>Tentin kesto tunteina / Exam in hours:</b> 3 h
<b>Tentaattori(t) / Examiner(s):</b> Professor (acting) Jaakko Simonen	<b>Sisäinen postiosoite / Internal address:</b> jaakko.simonen@oulu.fi
<b>Tentissä sallitut apuvälineet / The devices allowed in the exam:</b> <input checked="" type="checkbox"/> Funktiolaskin / Scientific calculator <input type="checkbox"/> Ohjelmoitava laskin / Programmable calculator <input type="checkbox"/> Muu tentissä sallittu materiaali tai apuvälineet. Tarkenna alla. / Other material or devices, allowed in the exam. Specify below.  Click here to enter text. <input type="checkbox"/> Tentissä ei ole sallittua käyttää apuvälineitä / The devices are not allowed in the exam	
<b>Muut tenttiä koskevat ohjeet opiskelijalle (esimerkiksi kuinka moneen kysymyksen opiskelijan tulee vastata) / Other instructions for students e.g. how many questions he/she should answer:</b>  <b>Important !</b> <u>You can choose to answer question 1 or 2, not both!</u> Questions 3 - 5 are for everyone. In total you can answer to 4 questions. Please remember to explain shortly what you are calculating in different situations.	

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### Tentin kysymykset / Exam questions:

1. a) Describe carefully with few sentences and graphically firm's cost minimisation problem in a general level. (You can assume the Cobb-Douglas production function). What we mean by a corner solution?

(2 points)

b) Suppose a firm's production function  $y = z_1^\alpha z_2^\beta$ , where  $z_1$  and  $z_2$  are inputs,  $y$  is output and  $\alpha$  and  $\beta$  are positive parameters. Using the Lagrangean method find the cost-minimising values of the inputs, i.e. conditional factor demand functions. (You don't have to solve the cost function!)

(4 points)

2. Use modified Slutsky equation to describe how changes in wage rate affects to the labour supply. (You do not have express the exact form of Slutsky equation). Interpret the research results (presented in table below, related to the effect of wage to labour supply) of Blundell & Walker (Economic Journal, 1982). Draw figures to clarify and enliven your answer (a short essay).

	<i>total</i>	<i>subst</i>	<i>income</i>
Men:	-0.23	+0.13	-0.36
Women:			
No children	+0.43	+0.65	-0.22
One child	+0.10	+0.32	-0.22
Two children	-0.19	+0.03	-0.22

(6 points)

3. Consider a market with only 2 firms. Cost functions ( $c_i$ ) for firms ( $i=1,2$ ) are;  $c_1(q_1) = q_1$  for firm 1 and  $c_2(q_2) = 2q_2$  for firm 2.  $q_i$  is the output of firm  $i = 1, 2$ . Demand function of the market is on  $D(p) = 100 - p$ .

a) Solve Cournot –Nash equilibrium, when firms make decisions over their output quantities simultaneously.

b) What are the firms' profits ( $\pi$ ) in the equilibrium?

c) Which firm has higher market share (you must calculate this) and why?

(6 points)

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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's law, contract curve and core of economy.

(2 points)

- b) There are two commodities (goods) ( $i=1,2$ ) and two individuals ( $h=a,b$ ) 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

$$R^a = (15,6) \quad \text{and} \quad R^b = (12,18)$$

- 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?
- Derive a contract curve (when total resources remain fixed).

(4 points)

5. Let's assume the game shown in a table on below. Define first shortly what means Strategy and Nash equilibrium. Show first whether there is/are the pure strategy Nash equilibrium/equilibria (explain/define your answer carefully). What is the mixed strategy equilibrium in the game? Suppose that player  $a$  plays [West] with probability  $p$  and players  $b$  plays [West] with probability  $q$ .

		Player b	
		[West]	[East]
Player a	[West]	(2,-3)	(1,2)
	[East]	(1,1)	(4,-1)

(6 points)

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*Opettajalle: Jos tenttikysymykset sisältävät matemaattisia kaavoja, kuvia tms. sisältöä, joka ei saa muuttua, toimita tämä tenttilomake docx-muodossa ja varsinaiset tenttikysymykset erillisenä liitteenä pdf-muodossa. Toimita tentin kysymykset sekä suomeksi että englanniksi, jos tentissä on kansainvälisiä opiskelijoita.*

*For teacher: If the exam questions have mathematical formulas, pictures or other content that should not change, please send two separate documents: this general exam form in docx-format and the actual exam questions in pdf-format. Submit the exam questions both in Finnish and in English if there are international students in the exam.*