

YLEISEN TENTIN TENTTILOMAKE - GENERAL EXAM FORM

Opiskelija täyttää / Student fills in

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

Opintojakson koodi / The code of the course: 721345A	
Opintojakson (tentin) nimi / The name of the course or exam: Intermediate microeconomics	
Opintopistemäärä / Credit units: 6 Mikäli kyseessä on välikoe, opintopistemääräksi täytetään 0 op. 0 ECTS Credits is used for mid-term exams.	
Tiedekunta / Faculty: Oulu Business School	
Tentin pvm / Date of exam: 6.2.2019	Tentin kesto tunteina / Exam in hours: 3 h
Tentaattori(t) / Examiner(s): Mikko Vaaramo	Sisäinen postiosoite / Internal address: 6 OyKKK
Tentissä sallitut apuvälineet / The devices allowed in the exam: <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. <input type="checkbox"/> Tentissä ei ole sallittua käyttää apuvälineitä / The devices are not allowed in the exam	
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: Answer to all 5 questions! All questions are equally weighted.	

Answer to all questions!

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

- a) What does the marginal utility (MU) measure?
Calculate marginal utilities MU_1 and MU_2 for both goods.
- b) What does the marginal rate of substitution (MRS) measure?
Calculate the marginal rate of substitution MRS_A for consumer A.

The price of good 1 is $p_1 = 2$ and the price of good 2 is $p_2 = 10$. Consumer's income is $m = 20$.

- 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.

2. Ms. Fogg is planning an around-the-world trip on which she plans to spend 10000 €. The utility from the trip is a function of how much she actually spends on it (Y), given by

$$U(Y) = \ln Y.$$

- a) If there is a 25 percent probability that Ms. Fogg will lose 1000 € of her cash on the trip, what is the trip's expected utility?
- b) Suppose that Ms. Fogg can buy full insurance against losing the 1000 € (say, by purchasing traveler's checks) at an actuarially fair premium of 250 €. What is her expected utility if she purchases this insurance?
- c) Does Ms. Fogg buy the insurance or face the chance of losing the 1000 € without insurance? Is she risk loving, risk averse, or risk neutral? Why?
- d) What is the maximum amount that Ms. Fogg would be willing to pay to insure her 1000 €?

3. Answer shortly (total max 1 page), but explain your answers:

- Explain in your own words what condition “market price equals marginal costs” ($p=mc$) means. Why is it important in economics?
- Firm’s cost function is $c(q) = 2q^2$. Inverse demand is $D^{-1}(q) = 100 - q$. What is the perfect competition equilibrium price and quantity?
- What is difference between short-run and long-run? At what price would firm produce zero output in short run?
- When would firm exit markets? When are the firms entering the market?

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

$$D(p) = 300 - p$$
$$S(p) = 1/2p - 30$$

- What is the equilibrium price and quantity in this market? Calculate consumer and producer surplus.
- Suppose that government imposes a quantity tax $t = 15$ on firms. Solve the new market equilibrium.
- Calculate the effect of the tax on the consumer and producer surplus.
- Calculate the social welfare deadweight loss due to the tax policy.

5. There is two waste management companies, Firm A and Firm B, operating in the city area. Amount (quantity) of waste received is defined by q . Cost function for Firm A is $c(q_A) = 15q_A$ and cost function for Firm B is $c(q_B) = q_B^2$. Inverse demand function for waste management is $p(q_T) = 55 - q_T$, where q_T is total quantity waste received: ($q_T = q_A + q_B$)

Assume that firms are Cournot firms.

- Write down the reaction functions $R_A(q_B)$ and $R_B(q_A)$.
- What are the Cournot-Nash equilibrium quantities q_A^* , q_B^* and market price?
- What are the profits of the firms?

Now suppose that two firms form a cartel.

- Write down profit function for the cartel, $\Pi^m(q_T)$
- What are the quantities q_A and q_B that cartel produces and equilibrium price?
- What are total profits of the cartel?

