

YLEISEN TENTIN TENTTILOMAKE - GENERAL EXAM FORM

Opiskelija täyttää / Student fills in

Opiskelijan nimi / Student name: Click here to enter text.	Opiskelijanumero / Student number: Click here to enter text.
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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: Oulun yliopiston kauppakorkeakoulu / Oulu Business School	
Tentin pvm / Date of exam: 5.11.2018	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. Click here to enter text. <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 five (5) questions. All questions are equally weighted.	

1. Joe likes fruits and consumes apples x_A and bananas x_B and his utility function is $U(x_A, x_B) = x_A x_B$. The price of apples is $p_A = 3€$ and the price of bananas is $p_B = 4€$, and Joe's income to spend on fruits is 48€.

- Write down Joe's budget constraint. What is the slope of the budget line?
- What does the marginal rate of substitution (MSR) measure? Calculate the marginal rate of substitution for Joe.
- Solve Joe's utility maximizing affordable consumption bundle (x_A^*, x_B^*) .
- What is the highest achievable level of utility $U(x_A^*, x_B^*)$?

2. Emily is offered a possibility to make a risky investment of 10 000€. Initial wealth is $w=10\,000€$ and with investment she can earn 4400€ with probability π or lose 1900€ with probability $1-\pi$.

Utility function is $U(w) = \sqrt{w}$.

- Is Emily risk averse, risk neutral or risk loving? Why?
- If $\pi=0.4$ what is Emily's certainty equivalent (CE) for risky choice?
- Again, with $\pi=0.4$ what is Emily's risk premium?
- With $\pi=0.4$, is Emily going to invest her money?
- At what probability π is Emily indifferent between investing and not to invest?

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

- Explain in your own words what condition "market price equals market 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. In the large beach, there is competitive markets for renting out surfboards for one day. Market demand for surfboards per one day is $D(p) = 350 - 2p$ and market supply is $S(p) = 5p$

- Write down the inverse demand function $D^{-1}(q)$ and inverse supply function $S^{-1}(q)$
- Solve equilibrium quantity q^* and equilibrium price p^*
- What are the consumer and producer surpluses (CS, PS) and total surplus?

Government imposes quantity tax $t=7\text{€}$ on sellers.

- Solve new market equilibrium quantity q^t and prices p^t .
- Calculate tax revenue and consumer and producer surpluses (CS^t, PS^t) after the tax.
- What is the deadweight loss of the tax?

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?

