KOULUTUSPALVELUT
1.8.2018

UNIVERSITY OF OULU

YLEISEN TENTIN TENTTILOMAKE - GENERAL EXAM FORM

Opiskelija täyttää / Student fills in

Opiskelijan nimi / Student name:	**Opiskelijanumero / Student number:**
Click here to enter text.	Click here to enter text.

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: 12.12.2018	**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:	
☒ Funktiolaskin / Scientific calculator ☐ Ohjelmoitava laskin / Programmable calculator ☐ Muu tentissä sallittu materiaali tai apuvälineet. Tarkenna alla. / Other material or devices, allowed in the exam. Specify below. Click here to enter text. ☐ 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.	

Question 1.

Consumer A has Cobb-Douglas preferences: $U(x_1,x_2) = x_1^{\frac{1}{3}} x_2^{\frac{2}{3}}$, 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 $p_2 = 4$.
Consumer's income is $m = 18$.

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.

Question 2.

a) Explain what does consumer surplus mean? Illustrate your answer with a graph.

b) If supply is inelastic and there is tax added, what happens to the producer and consumer surpluses? Illustrate your answer with a graph.

c) What does deadweight loss (excess burden) mean? What happens to deadweight loss, if supply is inelastic and there is tax added? Illustrate your answer with a graph.

Question 3.

Consumer B is working in a factory, and she can earn 10 000 € during the summer. The utility from working is a function of how much she earns (Y), given by

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

a) If there is a 25 percent probability that Consumer B will lose 1000 € of salary during the summer, what is the expected utility?

b) Suppose that Consumer B can buy full insurance against losing the 1000 € (say, by purchasing health insurance) at an actuarially fair premium of 250 €. What is her expected utility if she purchases this insurance?

c) Does Consumer B 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 Consumer B would be willing to pay to insure her 1000 €?

Question 4.

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

$D(p)=q=100-p$

$S(p)=q=50$

a) Solve the market equilibrium and producer and consumer surpluses.

Now government imposes quantity tax $t=10$ on firms.

b) Solve the new market equilibrium.
c) What happens to the surpluses? Solve the deadweight loss.
d) What is the amount of tax revenue the government can expect?

Question 5.

Aggregate market demand is given by $q(p) = 50 - (p/2)$, where q is the quantity and p is the market price. The total cost function for any firm in the industry is $c(q) = 4q$.

a) Assume that there is only one firm producing in the market.
   - Write down the monopoly's profit function $\pi(q)$.
   - What is the profit maximizing level of output q^m for the monopolist?
   - What would be the market price?

b) Assume there are two Cournot firms (i.e. quantity competition) operating in the market.
   - What would be the reaction functions $R_1(q_2)$ and $R_2(q_1)$?
   - What would be the Cournot-Nash equilibrium quantities q_1^* and q_2^*?
   - What would be the market price?

c) Assume there are two Bertrand firms (i.e. price competition) operating in the market.
   - What is the Nash equilibrium market price? Explain the adjustment process of price setting.
   - What would be the market demand?