YLIOPISTOTENTTI - UNIVERSITY EXAM

Opiskelijan nimi / Student name:	Opiskelijanumero / Student number:

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: 23.5.2017	Tentin kesto tunteina / Exam in hours: 3
Tentin nro / No. of the exam: 3	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:

☐ Nelilaskin / Standard calculator ☒ Funktiolaskin / Scientific calculator ☐ Ohjelmoitava laskin / Programmable calculator

☐ Muu materiaali, tarkennettu alla / Other material, specified below:

Tenttiin vastaaminen / Please answer the questions:
☒ Suomeksi / in Finnish ☒ Englanniksi / in English

Suomenkielisessä tutkinto-ohjelmassa olevalla opiskelijalla on oikeus käyttää arvioitavassa opintosuorituksessa suomen kieltä, vaikka opintojakson opetuskieli olisi englanti. Tämä ei koske vieraan kielen opintoja. (Kts. Koulutuksen johtosääntö 18 §)

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 the Education Regulations 18 §)

Kysymyspaperi on palautettava / Paper with exam questions must be returned:
☒ Kyllä / Yes ☐ 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, y -space. (You can assume the Cobb-Douglas utility function). *(2 points)*

    b) Suppose that consumer has a utility function $u(x, y) = -1/x - 1/y$ where $x > 0, y > 0$. Budget constraint is $m = p_x x + p_y y$. Use this information to calculate:
    - Marshallian demand functions
    - Indirect utility 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). How would you describe your own labor supply curve? Draw figure(s) to clarify and enliven your answer. *(6 points)*

3. 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 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

    $R^a = (9,3)$ 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)

4. a) Consider a duopoly with identical firms. Define (draw a figure and explain shortly) in a general level what is the Cournot-Nash equilibrium. <u>Draw firms' iso-profit curves, reaction functions and Nash equilibrium to the figure.</u> (*2 points*)

b) Lets' continue with Duopoly case. The cost function of firm 1 is $(y_1) = 30y_1$. The cost function of firm 2 is $C(y_2) = (y_2)^2$. Inverse demand function of the market is on $p = 120 - Q$, where Q is total output. Solve Cournot –Nash equilibrium, when firms make decisions over their output quantities simultaneously. What are the firms' outputs and profits in a Nash equilibrium of Cournot's model? (*4 points*)

5. a) Explain shortly what means certainty equivalent and risk premium? (*3 points*)

b) Suppose you have to pay $2 for a ticket to enter a competition. The prize is $19 and the probability that you win is 1/3. You have an expected utility function with $u(x) = \log x$ and your current wealth is $10.

- What is the certainty equivalent of this competition?
- What is the risk premium?
- Should you enter the competition?
(*3 points*)