i Candidate instructions

ECON3220/4220 – Microeconomics 3

This is some important information about the postponed exam in ECON3220/4220. Please read this carefully before you start answering the exam.

Date of exam: Monday, January 13, 2020

Time for exam: 09.00 a.m. – 12.00 noon (3 hours)

The problem set: The problem set consists of six problems, with several sub-problems. They count as indicated. Start by reading through the whole exam, and make sure that you allocate time to answering problems you find easy. You can get a good grade even if there are parts of problems that you do not have time to solve.

Sketches: In this exam, you may submit sketches on all problems. You are to use the sketching sheets handed to you. You can use more than one sketching sheet per problem. See instructions for filling out sketching sheets on “Scantron information” below. It is very important that you make sure to allocate time to fill in the headings (the code for each problem, candidate number, course code, date etc.) on the sheets that you will use to add to your answer. You will find the code for each problem under the problem text. You will NOT be given extra time to fill out the "general information" on the sketching sheets (codes for each problem, candidate number etc.)

Resources allowed: No written or printed resources - or calculator - is allowed (except if you have been granted use of a dictionary from the Faculty of Social Sciences).

Grading: The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

1 Anastasia (weight 20%)

Anastasia has a two-period utility function $u^A = \alpha \ln x_1 + (1-\alpha) \ln x_2$, where x_1 is the amount of consumption in period i=1,2 and $\alpha \in (0,1)$. Anastastia's resources consist of a unit of assets in period 1, which can be partly spent on consumption in period 1 and, for the remaining part, invested in an asset giving a return r (for later use as consumption in period 2).

a. Interpret the parameter α.

Fill in your answer here and/or on sketching paper

b. Obtain the consumption demands (first for an arbitrary available amount of money and then for the specific resources of Anastasia).

Fill in your answer here and/or on sketching paper

c. Discuss the income and substitution effects of the return r.

Fill in your answer here and/or on sketching paper

d. Determine the indirect utility function and verify Roy's identity for consumption in period 2.

Fill in your answer here and/or on sketching paper

Maximum marks: 20

2 BoltNa (weight 15%)

BoltNa produces y with two inputs, z_1 and z_2. The technology is summarized by the production function:
$y \leq \left(\alpha z_1^{-1} + z_2^{-1}\right)^{-1}$ with $\alpha > 0.$

a. Define and compute the elasticity of substitution between inputs.

Fill in your answer here and/or on sketching paper

b. Determine the cost function.

Fill in your answer here and/or on sketching paper

c. Can you determine the profit function? Briefly discuss.

Fill in your answer here and/or on sketching paper

Maximum marks: 15

3 Citty (weight 15%)

Citty is a town where markets are perfectly competitive. Anastasia lives there together with her friend Colin. Colin's preferences are described by the utility function:
$u^C = \min\{\delta x_1, x_2\}$, where $\delta > 0$ and x_i is the amount of consumption in period i=1,2. Colin has 2 units of assets in period 1 as resources.

At the Walrasian equilibrium $r = 2$.

a. Compute the equilibrium allocation for Anastasia and Colin.

Fill in your answer here and/or on sketching paper

b. Compute the excess demands for consumption in period 2 of Anastasia and Colin. Why is the sum of this excess demand not 0 at the equilibrium?

Fill in your answer here and/or on sketching paper

c. Using the first welfare theorem, discuss the properties of the equilibrium.

Fill in your answer here and/or on sketching paper

Maximum marks: 15

4 Problem 4 (weight 10%)

True or false? For each of the statements, if true, try to explain why, and if false, provide a counter-example.

a) In a finite normal-form game, every strategy of each player is either strictly dominated or strictly dominates any other strategy.

b) In a finite normal-form game, if a pure strategy of a player is strictly dominated by another pure strategy, then the former strategy cannot be a best response to any belief that the player has about the strategies played by his opponents.

Fill in your answer here and/or on sketching paper

Maximum marks: 10

5

Problem 5 (weight 20%)

In the presence of Mary, Peter tosses a 10-kroner coin. After seeing whether the outcome is Heads or Tails – but before showing this to Mary – Peter has the opportunity to propose a bet, which Mary must accept or reject before she sees the outcome of the toss. If he proposes the bet and Mary accepts, then Mary must pay 100 kroner to Peter if the outcome is Heads, while Peter must pay 100 kroner to Mary if the outcome is Tails. If he proposes the bet and Mary rejects, then no payments are made. Peter keeps the 10-kroner coin if he does not propose the bet, while Mary keeps the 10-kroner coin if Peter proposes the bet (independently of whether she accepts or rejects the bet and independently of the outcome of the toss).

a) Present the above situation as an extensive-form game.

b) Show that Peter never proposes the bet!

Fill in your answer here and/or on sketching paper

Maximum marks: 20

6

Problem 6 (weight 20%)

Consider an insurance market where insurance is offered by a large number of risk-neutral insurance companies and where consumers have private information about their accident probabilities, which are either low or high. Consumers are risk-averse and maximize expected utility. Their expected utility is given by

$$EU = \pi u(w - L) + (1 - \pi)u(w)$$

if they do not buy insurance, where $u' > 0$ and $u'' < 0$, w is initial wealth, L is the loss incurred in case of an accident, $\pi = \underline{\pi}$ if the accident probability is low, $\pi = \bar{\pi}$ if the accident probability is high, and $0 < \underline{\pi} < \bar{\pi} < 1$. An insurance contract specifies that a consumer pays a premium p to her insurer and receives a benefit B from her insurer in case of an accident. Hence, the expected utility of contract (B, p) equals:

$$EU = \pi u(w - L + B - p) + (1 - \pi)u(w - p)$$

We should interpret $L - B$ as the deductible.

Provide short answers to the following questions:

a) Assume that there exists an equilibrium in such an insurance market. Why do the consumers with the low accident probability pay a deductible, while the consumers with the high accident probability do not?

b) If you were faced with a hypothetical choice in this market, between being a consumer with the high accident probability and consuming its contract without a deductible and being a consumer with the low accident probability and consuming its contract with a deductible, which kind of consumer would you choose to be and why?

c) Why may an equilibrium fail to exist if there is a high proportion of consumers with the low accident probability?

Fill in your answer here and/or on sketching paper

Maximum marks: 20