

i Candidate instruction**ECON3220/4220 - Microeconomics 3**

Postponed written examination
Friday, 12 January 2023, at 09.00-12.00 (3 hours)

About the exam

- The examination consists of six questions - some with sub-questions.
- Question 1 counts for 10%, question 2 counts for 20%, questions 3 counts for 20%, questions 4 counts for 30%, question 5 counts for 10% and questions 6 counts for 10% of the total grade.
- The examination text is in English and you may submit your response in Norwegian, Swedish, Danish or English.

Digital candidate instruction

You will find candidate instructions for the school examination as an external resource in the text. The candidate instructions show how UiO conducts the school examination.

Examination support material

Open book examination, where all printed and written resources are allowed.

Digital sketches

- You may use sketches on all questions.
- You are to use the sketching paper handed to you.
- You can use more than one sketching sheet per question.
- Read the instruction for filling out sketching sheets below.
- You will NOT be given extra time to fill out the "general information" on the sketching sheets (task codes, candidate number etc.)

After the exam

You will not have access to your answer right after the exam. The reason is that the sketches must be scanned into your answer. You will have access to the answer after approx. 2-3 days. You are encouraged to check your answer and see that all scantron sheets have been included and are correctly placed. If something is not correct, you must immediately send an email to post@econ.uio.no.

1 Question 1

Define the following terms and explain how they are related: static game, dynamic game and repeated game.

Fill in your answer here

2 Question 2

Two agents, 1 and 2, make decisions simultaneously. Each agent has two possible actions, P and W . If both choose P , they each get a payoff of 1; if both choose W , they each get a payoff of 0; if 1 chooses P and 2 chooses W , 1 gets a payoff of -1 and 2 gets a payoff of x ; and if 1 chooses W and 2 chooses P , 1 gets a payoff of x and 2 gets a payoff of -1.

A.

Write the game in normal form.

B.

Let $x = 2$. Explain that the strategy profile with both players choosing W is an equilibrium in dominant strategies. Is it a Nash equilibrium?

C.

Let instead $x = -1$. Are there any equilibria in dominant strategies? Are there any Nash equilibria?

Fill in your answer here

3 Question 3

For the remainder of the questions let $x = 2$. Suppose the above game – the "stage game" – is repeated T times and that T is finite, i.e. $T < \infty$. The two agents discount future payoffs by the factor $0 < \delta \leq 1$.

How would you solve this repeated game? What is the equilibrium solution concept? What is the solution? Does the solution depend on the values of T and δ ?

Fill in your answer here

4 Question 4

Suppose instead that the game is repeated infinitely many times, i.e. $T = \infty$.

A.

Explain that the solution found above when the stage game is repeated finitely many times is also a solution when the stage game is repeated infinitely many times.

B.

Is there an equilibrium of the infinitely repeated game in which both agents choose P at every stage? How does the answer depend on the value of δ ?

Fill in your answer here

5 Question 5

Consider again a repeated game, but assume now that, after any given stage, with probability π the stage game is repeated again, while with probability $1 - \pi$ the stage game is not repeated and the game stops.

Explain that this game corresponds to a game in which the stage game is repeated infinitely many times and agents' discount factor is $\pi\delta$. Discuss how the existence of an equilibrium in which both agents choose P at every stage depends on π .

Fill in your answer here

6 Question 6

When studying a real-world phenomenon, the theorist should make assumptions that reflect aspects of the world that are central to phenomenon under study.

Based on the above analysis, discuss when it makes sense to assume finitely and infinitely repeated interaction between agents, respectively.

Fill in your answer here