Lisbon School of Economics & Management
Universidade de Lisboa

Microeconomics
Fall 2023-2024
Midterm 2
November 2023

Duration: 1 hour (60 minutes)

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General Guidelines

- You may use a calculator;
- You may **not** use a programmable calculator;
- You may **not** use notes or books;
- You may have some food and beverages on your desk;
- All other belongings, including phones, must be on the floor;
- You can only leave the room after 30 minutes into the exam and up unto 15 minutes before the exam ends;
- Write all your answers on the blank answer sheets brought by you;
- Write your name and student number on every answer sheet;
- Number all your answer sheets and hand them in in chronological order;
- If a question does not ask for an explanation, there is no need to give one;
- This exam is to be handed in together with your answer sheets;
- Any form of fraud will, at least, imply an invalid grade for this course.

1. Utility maximization (6 points)

Consider a consumer with a utility function equal to $u = x_1^{\alpha} x_2^{\beta}$. The consumer has income m, and the price for good x_1 and x_2 are denoted by p_1 and p_2 respectively.

1.1. Find the Marshallian demand functions for both good 1 and 2.

1.2. Use the demand functions derived in question 1.1 to show how the values of α and β affect the demand for goods 1 and 2. You may assume that both α and β are greater than zero.

2. Choice (7 points)

2.1 If the Marshallian demand curve is less steep than the Hicksian demand curve, what can you conclude about the income effect? Use the Slutsky equation or a graph with indifference curves and budget lines to explain your answer.

2.2 Your colleague argues that, under the standard assumptions on preferences, both the Marshallian and Hicksian demand curve can be upwards sloping. Explain if your colleague is correct or incorrect.

2.3 Your colleague argues that because of duality the Marshallian demand function and Hicksian demand function are equal at every price. Explain if your colleague is correct or incorrect.

3. Consumers' surplus (7 points)

Consider a consumer with a utility function equal to $u = 2\sqrt{x_1} + x_2$.

3.1. Carefully sketch two indifference curves corresponding to different levels of utility for the utility function above. Carefully draw three budget lines in this graph that allow you to infer both changes in Marshallian and Hicksian demand when the price of good 1 changes. Use this to draw both the Marshallian and Hicksian demand curve of good 1 in a new graph. What do you conclude about the relationship between the two demand curves?

Consider that, in addition, the consumer has income $m = 40$, and the price for good x_1 and x_2 are $p_1 = 1$ and $p_2 = 4$ respectively.

3.2. Consider that p_1 changes from 1 to 2. Find the compensating variation for this change in the price of good 1.

3.3. Use your answer to question 3.1 to argue that for the utility function above the compensating variation is equal to the change in consumer surplus. Also briefly explain why this equivalence between the compensating variation and the change in consumer surplus is useful.