Midterm

You have 60 minutes to answer **three out of** the following **four** equally weighted questions.

Please **do not** separate the sheets of this booklet.

Your **name**: _____

Your **student ID number**: _____

Your **signature**: _____

Viel Glück / good luck !!!

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Q1:

Q2:

Q3:

Q4:   **total:**

Question 1: Consider a consumer with expenditure function $E(p_1, p_2, U) = U\, p_1^{1/2}\, p_2^{1/2}$.

    a) Derive mathematically his/her Hicksian (that is compensated) demand functions for both goods.

    b) Derive mathematically his/her Marshallian (uncompensated) demand functions for both goods.

    c) Describe in detail (so that I could easily follow your recipe) a second way how you could derive these Marshallian demands (starting from the expenditure function, of course).

    d) Are goods 1 and 2 complements or substitutes? Could it be otherwise? Pls justify your answers.

    e) A tax on good 1 raises its price by 44 %. Calculate the equivalent and compensating variations.

Question 2: By now we know Robinson Crusoe's medical condition: he is schizophrenic and acts as a price-taking consumer/producer in a market economy despite being alone on his island. Production technology is given by the production function $C = f(L) = L$, where C stands for a consumption good and L for time worked, and his preferences can be represented by $U(C, L) = C^{1/2} (1-L)^{1/2}$. Note that time is measured in days and that he has an endowment of one unit of time.

a) Derive Robinson's (the consumer's) demand and labor supply functions.

b) Analyse the production behavior of Crusoe Inc. (be a bit careful here).

c) What will be the market outcome?

d) Schizophrenia worsens. Self-proclaimed governor Crusoe introduces a 10 % consumption tax and rebates tax revenue lump-sum to consumer Robinson. What is the new market outcome? Is it efficient?

Question 3: Consider an exchange economy populated by Heide and Udo. Both of them have identical preferences which can be represented by $U(x_1, x_2) = x_1 - 1/x_2$, take prices as given, and have endowment vectors $(e_1^H = 8, e_2^H = 0)$ and $(e_1^U = 0, e_2^U = 8)$ respectively.

a) Draw the corresponding Edgeworth box (don't forget to label axes and Heide and Udo's corners), indicate the endowment point, and depict the specific (not just a generic) contract curve.

b) Calculate the market outcome, ie equilibrium price and quantities.

c) State Walras' law and verify it for this economy.

d) Abstracting from the endowments and assuming monetary income instead, can you aggregate their individual demands so that aggregate demand will be a function of aggregate income and will not depend on the income distribution? Justify your answer and demonstrate if possible.

Question 4:

    a) Derive mathematically the own and cross price Slutsky equations.

    b) For the own price Slutsky equation, sign the overall effect distinguishing different cases.

    c) Repeat b) for a good in net supply.

    d) Argue why the Slutsky matrix of substitution effects is symmetric, ie why $\partial D_i^c/\partial p_j = \partial D_j^c/\partial p_i$

    e) Let $U(x_1, x_2) = x_1^{\alpha} x_2^{1-\alpha}$ and $I = p_1 x_1 + p_2 x_2$. Derive the specific own price Slutsky equation for this case. Which case from b) applies here?