ECON 203
Midterm on Consumer Theory

Be sure to show your work for all answers, even if the work is simple.

This exam will begin at 17:40 and end at 19:20

1. *(19 points)* **Honor Statement:** Please read and sign the following statement:

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2. *(24 points total)* About the normative definition of rationality.

   (a) *(9 points)* Write down the three axioms of preferences that make up this definition and define each axiom. Let $A \succsim B$ mean "the consumption bundle A is at least as good as the consumption bundle B."

   (b) *(9 points)* Give a counter example to each axiom. (These can not be about indifference curves.)

(c) *(6 points)* Two of these have clear implications in terms of indifference curves, draw indifference curves that are not allowed by each of these axioms and explain. (You may make all the other normal assumptions about preferences.)

3. *(21 points)* About the income effect.

   (a) *(7 points)* Given the Duality identity: $h_x(p_x, p_y, u) = X(p_x, p_y, I(p_x, p_y, u))$ and the Envelope theorem which implies $\partial I/\partial p_x = X$ derive the Slutsky equation in elasticity form: $e_x(p_x) = e_{h_x}(p_x) - e_x(I)\, s_x$.

(b) *(8 points)* Give the physical definition of each term in the Slutsky equation and state what we know either about it's sign or range. Also indicate which part is the substitution effect and which part is the Income effect.

(c) *(6 points)* Assume that bread is an inferior good with downward sloping demand, the Turkish government wants to increase the total amount of bread Turks consume and make everyone happier. Which of the following three policies would accomplish this? Explain the problem with the other two policies.

i. Change in the price of bread (either raising or lowering the price.)
ii. Change in Income (either raising or lowering income.)
iii. Giving out free bread to every citizen.

4. *(4 points)* Explain why every model must be wrong by definition.

5. *(32 points total)* A *corner solution* is a case where one or more variables is at its constrained amount, in our case this is zero. In this question we are interested in when consumers might be at a corner solution, or consume zero of one or more goods. You may assume throughout that the consumer has normal preferences, i.e. her preferences are rational, continuous, monotonic, and convex.

   (a) *(4 points)* What assumption do we usually make about preferences that rules out corner solutions? Explain.

   (b) *(5 points)* In the real world, are corner solutions common or rare? Explain why you think this. (Note: A good argument is worth points even if your guess is wrong.)

   (c) *(23 points total)* Consider the utility function $U(F, C) = 11 \ln F + C$, the price of food is p_f, of clothing is p_c, and the income is I. (In your answers below you can not use the cheating method I described in class.)

      i. *(1 point)* What class of utility functions is this from?

      ii. *(2 points)* Set up the Lagrangian objective function for this consumer, make the multiplier on the constraint λ.

iii. *(3 points)* Find the three first order conditions **assuming the consumption of clothing is strictly positive.**

iv. *(4 points)* Find the bang for the buck for food and clothing **assuming the consumption of clothing is strictly positive.**

v. *(4 points)* Equalize the bang for the bucks and find the demand for food **assuming the consumption of clothing is strictly positive.**

vi. *(2 points)* Find the demand for clothing **assuming the consumption of clothing is strictly positive.**

vii. *(2 points)* If the optimal quantity of clothing is zero, how much food will this consumer buy? (Hint: This question is ridiculously easy.)

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