Consumer and Producer Theory An-
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Fall
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MIDTERM EXAMINATION

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INSTRUCTIONS: Every question has the same weight. Answer ALL three questions. Show all relevant work. You have 90 minutes to do this. You may use a copy of Mas-Colell, Whinston and Green and/or Rubinstein's lecture notes for reference. Cross out all answers you DON'T want me to consider. Don't forget to write your name and/or ID number - I'd hate to give your grade to someone else! GOOD LUCK!

1 A preference relation $\succcurlyeq$ on X is called an **interval order** if for every $x, y, z, w \in X$ $y \succ x$ and $w \succ z$ implies that either $w \succ x$ or $y \succ z$. Does a rational preference have to be an interval order? What about a complete and **quasi-transitive** preference (i.e., a preference such that only the asymmetric part $\succ$ is transitive, while the transitivity of indifference may be violated)?

2. *(Exercise A3 in Rubinstein)* In an experiment, a monkey is given $m = 12$ coins which he can exchange for apples or bananas. The monkey faces repeated choices in which he gives a coin either to an experimenter holding a apples or another experimenter holding b bananas.

a) Assume that the experiment is repeated with different values of a and b and that each time the monkey trades the first 4 coins for apples and the next 8 coins for bananas. Show that the monkey's behavior is consistent with the classical assumptions of consumer behavior (namely, that his behavior can be explained as the maximization of a monotonic and convex preference relation on the space of bundles).

b). Assume that it was later observed that when the monkey holds an arbitrary number m of coins, then, irrespective of the values of a and b, he exchanges the first 4 coins for apples and the remaining $m-4$ coins for bananas. Is this behavior still consistent with the rational consumer model?

3. Recall that Sen's α axiom states that if $x \in A \subset B$ and $x \in C(B)$ then $x \in C(A)$.

a) Consider the following version of Manzini and Mariotti's expansion axiom: if $x \in C(A) \cap C(B)$ then $x \in C(A \cup B)$. Are the two properties related (you may assume that all the budget sets mentioned here are in $\mathcal{B}$)?

b) Consider the following choice procedure from a finite consumption space X ($\#X = n < \infty$). An individual has a rational preference over X but chooses all alternatives in B that are strictly preferred to by no more than $\frac{1}{4}(\#B)$ elements of B Would a choice structure thus generated have to satisfy α? What about WARP?