Course: **Microeconomics, New York University**

Lecturer: **Ariel Rubinstein**

Exam: **Mid-term, 16 October 2003**

Time: **3 hours (no extensions)**

Instructions: Answer the following three questions. Be concise and accurate as possible.

Problem 1

In a world with two commodities, consider a consumer's preferences which are represented by the utility function $u(x_1,x_2,..,x_K) = \sum_{k=1,..,K} x_k$.

(a) Calculate the consumer's demand function (whenever it is well defined).

(b) Calculate the indirect utility function, $v(p,w)$.

(c) Verify Roy's Equality.

(d) Calculate the expenditure function $e(p,u)$.

Problem 2

In this question, we will consider a consumer which behaves differently than the classical consumer we talked about in class. Once again we consider a world with K commodities. The consumer's choice will be from budget sets. The consumer has in mind a preference relation which satisfies continuity, monotonicity and strict convexity and for simplicity assume it is represented by a utility function u.

The consumer aims to maximize utility as long as he does not obtain the utility level u^0. If the budget set allows him to obtain this level of utility he chooses the bundle in the budget set with the highest quantity of commodity 1 subject to the constrain that his utility is at least u_0.

a) Formulate the consumer's problem.

b) Show that the consumer's procedure yields a unique bundle.

c) Is this demand procedure rationalizable?

d) Does the demand function satisfy the Walras Law?

e) Show that in the range of (p,w) for which there a feasible bundle yielding utility of at least u^0 the consumer's demand function for commodity 1 is decreasing in p_1 and increasing in w.

f) Is the demand function continuous?

Problem 3

A decision maker has a preference relation $\succsim$ over the space of lotteries $L(Z)$ with a set of prizes Z.

He knows at Sunday 1 that on Monday it will be revealed whether he has to choose between L_1 and L_2 (probability $1 > \alpha > 0$) or between L_3 and L_4 (probability $1 - \alpha$). Then he will make the choice.

Let us compare between two possible approaches the decision maker may take:

Approach 1: He delays his decision to Monday ("why to bother with the decision now while I can make mind tomorrow"..:)).

Approach 2: He makes a contingent decision on Sunday regarding what he will do on Monday, that is he instructs his machine/agent/himself what to do if he faces the choice between L_1 and L_2 and what to do if he faces the choice between L_3 and L_4 ("On Monday morning I will be so busy"...:)).

a) Formulate approach 2 as a choice between lotteries.

b) Show that if the decision maker's preferences satisfy the independence axiom his choice in approach 2 will be always the same as under approach 1.

c) Give an example for a preference relation for which the two approaches yield different outcomes!