UCLA

Department of Economics

Ph.D. Preliminary Exam

Microeconomic Theory
(Fall 2002)

Instructions:

- You have 4 hours for the exam
- Answer any 5 out of the 6 questions. All questions are weighted equally. Answering fewer than 5 questions is not advisable, so do not spend too much time on any one question. Do NOT answer all the questions.
- Use a SEPARATE bluebook for each question.

1. Short Takes

(a) "It is better to be a Cournot duopolist than a Bertrand duopolist." Explain, and comment on what economic fundamentals determine whether Bertrand or Cournot competition is relevant.

(b) "Spite doesn't really matter for competitive equilibrium in a large anonymous market place." True or False? Explain.

(c) "If all individuals have non-identical homothetic preferences, market demand may not be easy to characterize." True or False? Explain.

2. Life Cycle model

An individual lives for T periods, earning an income of y in each period. There are n commodities. The price of commodity j in period t is p_{jt}. Initially assume that prices are constant. The individual has a concave period utility function $v(c_t)$, where $c_t = (c_{1t},...,c_{nt})$ and a life cycle utility of

$$U(c) = \sum_{t=1}^{T} \delta^{t-1} v(c_t).$$

The interest rate is r.

(a) Characterize as completely as you can the circumstances under which this individual, will save in the early periods and dis-save in the later periods.

(b) Suppose $v(c_t) = {c_{1t}}^{\alpha} {c_{2t}}^{\beta}$, $\alpha, \beta > 0$. If the price of commodity 1 rises at a rate θ, that is, $p_{1t} = p_{1s}(1+\theta)^{t-s}$, under what conditions will the individual continue to save?

(c) Suppose $\alpha + \beta = 1$. Characterize the optimal consumption plan.

3. Price discrimination in private and public goods

Part I.

Buyers $b = 1,...,n$ has a reservation price β_b for one unit of a private good. There is a single seller with total cost $ck^2/2$ of supplying k units. For an added investment cost of F, the seller can employ a technology in which c is replaced by $d < c$.

(a) What are the conditions defining the social desirability of undertaking the investment?

(b) What conditions on β_b guarantee that the single seller would (i) make the right investment choice and (ii) sell the socially desirable quantity when the seller must charge the same price to every buyer?

(c) Same as (b), except that the seller can price discriminate.

Part II.

Each of n buyers has a reservation price β_b for a public good. There is a single seller who can supply it at a cost of c, or for an added investment of F, the cost can be reduced to d.

(d), (e), and (f) same as (a), (b), and (c), respectively

(g) Under what conditions, if any, is price discrimination incentive compatible? Does your answer depend on whether the good is private or public?

4. Long-run versus Short-Run with Noise

Consider the following normal form in which the row player is long-run

	a	b
A	4,4	1,0
B	0,0	0,2

If the long-run player's action is perfectly observed what is the worst payoff to the long-run player in the repeated game for discount factors near one?

Now suppose that the long-run player's action is observed with error. Specifically, if he chooses A, subsequent short-run players observe A with probability .9 and B with probability .1; if he chooses B, subsequent short-run players observe B with probability .9 and A with probability .1. Note that the normal form does not change, just the information available to subsequent short-run players after each match. Now what is the worst payoff to the long-run player in the repeated game for discount factors near one?

5. Benevolent Consumers

Alex is selfish with utility function $u_a(x_a, y_a)$ where x and y are two commodities. Bev cares about her own consumption and Alex's happiness. Her utility function is

$$U_b(x_b, y_b) = u(x_b, y_b) + \alpha u(x_a, y_a).$$

Alex has an income of I_a and Bev an income of I_b.

(a) If $u(x,y) = \ln x + \ln y$, assuming given market prices of p_x, p_y, under what conditions will Bev give part of her income to Alex?

(b) Assuming the condition you derived in part (1) holds, what gift will she make?

(c) Provide a necessary and sufficient condition for gift giving for a general concave utility function $u(x,y)$.

(d) Consider an economy with equal numbers of 2 types of consumer (so now prices are endogenous). Type A are selfish but each type A has one type B who cares. Assuming price taking behavior, and ignoring bargaining, define an equilibrium for this model. Is it Pareto efficient?

6. Is it tastes or costs?

Commodity 0 is the labor commodity and $k = 1, 2, \ldots$ are outputs. There are N consumers and each consumer i has the same utility function for $z_i = (z_{i0}, z_{i1}, \ldots)$:

$$V(z_i) = \begin{cases} \sum_{k=1}^{\infty} v(z_{ik}) + z_{i0} & \text{if } z_{i0} \geq -1 \text{ and } z_{ik} \geq 0 \\ -\infty & \text{otherwise} \end{cases}$$

Note: the consumer cannot supply more than one unit of labor and its marginal disutility is one. Assume

$$v(z) = (\alpha + z)^{1/2} - \alpha^{1/2}, \quad \alpha \geq 0.$$

There is free entry in the production of any commodity and $C(z_k)$ is the minimum quantity of labor to produce z_k. Assume that

$$C(z_k) = \begin{cases} F + z_k & \text{if } z_k > 0 \\ 0 & \text{if } z_k = 0 \\ \infty & \text{otherwise} \end{cases}$$

$F \geq 0$ is the labor set up cost to start production of a commodity.

(a) For fixed N, if $F>0$ is there any $\alpha \geq 0$ for which there is a price-taking equilibrium?

(b) If $\alpha = 0$ is there any $F \geq 0$ such that as N increases there is an approximate price-taking equilibrium?

(c) If $F = 0$, is there any $\alpha \geq 0$ such that as N increases there is an approximate price-taking equilibrium?

(d) If $F > 0$, is there any $\alpha \geq 0$ such that as N increases there is an approximate price-taking equilibrium?

(e) Of the two parameters above, α for tastes and F for costs, which would you say is more important in precluding price-taking equilibrium?