MICROECONOMIC THEORY, ECONOMICS 713, 2ND QUARTER, SPRING 2012
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MIDTERM

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Time: **75** minutes, Number of questions: **2,** Number of points: **40,** Rules: **Closed-book** exam

Good luck and allocate your time efficiently!

Question 1: Collusion [25 points] Consider an independent private value setting of an object with I bidders, each with valuation v_i of the object, drawn independently from the distribution F with density f. Each bidder knows only his own value and the distribution. The seller has value v_S, which he knows. This is common knowledge. The seller is convinced that the I bidders are colluding. The collusion works as follows: the I bidders hold a separate auction to determine who gets the good (i.e., who values the good the most) and what side-payments will be made to the others for participating in the collusion, and then the winner in the "collusion auction" submits the lowest acceptable bid and all other bidders bid less. The bidders commit to participating in the collusion auction. The seller wishes to determine the optimal (expected-revenue maximizing) reserve price r; i.e., he will sell the good at price r to the bidder who submitted the highest bid.

(a) Assume that there is just a single bidder (I=1). What reserve price r should the seller set to maximize expected revenue? (Hints: You may assume that [1 - F(v)]/f(v) is strictly decreasing in v. Assume monotone bids.)

(b) What is the optimal reserve price with I colluding bidders?

Suppose now that the bidders are not colluding and the seller knows this.

(c) Suppose we find the optimal reserve price in the second price auction. Would the first-price auction with the same reserve price be worse or better for the seller? Assume monotone bids. Explain carefully.

(d) Suppose now that r=0 and the seller uses the second-price auction. Assume that the values are not independent and the joint distribution of values (imperfect) exhibits correlation. Would bidding own value be a weakly dominant strategy? Explain (indicate where correlation enters your argument).

Question 2: Adverse Selection [15 points]

Dan is considering buying a MacBook Air from Antonio, who has used it for one year. Dan, who is a computer science major, knows the value of Antonio's laptop, θ. Antonio, a humanities major, only knows that θ is uniformly distributed on [0,2] [$ thousand]. Who knows what is common knowledge among the players. Conditional on the laptop's value, Antonio's utility from his laptop is $u_A = v_A\theta$, whereas Dan derives utility $u_D = v_D\theta$, $v_D > v_A$. Suppose that Dan and Antonio can trade at price p, if they both agree to trade.

(i) Find the prices at which Dan and Antonio can trade.

(ii) Is trade ex post efficient? Explain. Explain also how lowering the price by Dan would affect your answer.

(iii) Suppose now that neither Dan nor Antonio know the value of Antonio's laptop θ and only know that θ is uniformly distributed on [0,2]; this is common knowledge. If they can trade at price p, provided that they both agree, is trade efficient? Explain and compare your answer with that in (ii).