

UNIVERSITY OF VICTORIA
Examinations April 2003
ECONOMICS 452: Information and Incentives

INSTRUCTOR: L. WELLING
TOTAL MARKS: 100

DURATION: 2 HOURS

Do all questions. Use at least one-half page for each diagram, and label all axes.

1. (30) Each of the following statements is TRUE, FALSE, or (possibly) UNCERTAIN. State which, and justify your choice, in no more than one page (double-spaced). Do THREE questions; each is worth 10 points.
 - a) In a common value auction setting, an increase in the number of bidders will lower an agent's optimal bid.
 - b) In first price, sealed bid, private value auction, it is optimal for an individual to submit a bid equal to their valuation.
 - c) One hundred and one individuals choose between two options x and y by voting in the conventional way. Everyone prefers x to y . The outcome in which everyone votes for y is a Nash equilibrium.
 - d) Since sharing the benefits with more people increases free-riding, it would be better to join a two-person partnership than a three-person partnership.

2. Jackson is preparing his income tax return, and is considering the costs and benefits of under-reporting his annual income. He faces a tax rate of 50% on earned income, and if he reports his income truthfully, he will have an *after-tax* income of 100. If he is caught under-reporting, he will be required to pay all taxes due, *and* he will be fined F dollars for each unreported dollar of income.

Jackson's only source of wealth is his income, and his utility of wealth function is given by $U(w) = \ln(w + 100)$.

- a) Is this a "moral hazard problem", or an "adverse selection problem"? Explain briefly. For whom is this a problem?
- b) Suppose that if Jackson cheats on his income tax, he will be caught with probability $\rho = 0.1$.

4. Eli and Jake are runners competing for a gold medal in the 100 metre dash. Both can take steroids to enhance their speed. Let x and y denote the quantities of steroids used by Eli and Jake, respectively. The probability that Eli wins the race is $x/(x+y)$, and the probability that Jake wins the race is $y/(x+y)$. The value of winning the race is 100, and the cost, inclusive of adverse effects on the runner's own health, is 1 per unit of steroids consumed. Each runner chooses the quantity of steroids to maximize their own expected payoff.
- Write down the optimization problems of the two players.
 - Given y , find the value of x that maximizes Eli's objective function. Given x , find the value of y that maximizes Jake's objective function.
 - Find the equilibrium values of x and y .
 - Show that the equilibrium is not Pareto optimal
 - In no more than one page (double-spaced) explain the nature of the problem here.
5. (20) Many employers in Canada offer extended health benefit plans to their employees (these plans supplement the provincial medical plans). Typically, all employees of the same firm are insured under the group plan. Often the per-person group rate is significantly lower than the rate an individual member could obtain on the open market.

In one-and-a-half to two pages (double-spaced), develop an asymmetric information explanation of this phenomenon.

THE END