

## Economics 504 (2008) Microeconomic Theory II – Midterm II

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**Instructions:** This is an open book exam, you can use any written material. You have 1 hour 20 minutes. So all three questions, each has equal weight. Good luck!

1. Consider the problem of allocating a single object to two agents. Agent 1's valuation is distributed uniformly on  $[0,1]$ ; agent 2's valuation is uniformly and independently distributed on  $[0,2]$ .

(a) Formulate this as a mechanism design problem. What is the pivotal VGC mechanism?

(b) Assume now that  $b_1$  and  $b_2$  are continuous and strictly increasing bid functions that constitute a BNE equilibrium of the first price auction. Is the allocation of the object ex-post efficient? [Hint: Do not try to solve for the first price auction equilibrium!]

(c) How do you contrast your findings in parts (a) and (b) to the payoff equivalence result established in class?

2. Consider a sequential two player public good contribution game in which the provision of a public good is determined by the larger of the two contributions. Players can contribute any integer amount between zero and eight. Each unit contributed costs 164. The benefit to both players from the  $x$  units of contribution is  $205x - 5x^2$ . Suppose that in 20% of the matches, player 1 contributed 4 and player 2 contributed 0, and that in 60% of the matches player 1 contributed 0 and player 2 contributed 4, while in the remaining matches player 1 contributed 0 and player 2 contributed 2. Suppose that players maximize money payoffs. How well does subgame perfection describe the experimental results? Nash equilibrium? What are the knowing losses (heterogeneous self confirming losses) of each of the two players?

3. In the hunter-gatherer game, there are two players a hunter and a gatherer. Each player chooses between two strategies, hunting and gathering. If they both hunt, or both gather, both get 0. If the hunter hunts and the gatherer gathers, both get 2 and if the hunter gathers and the gatherer hunts, they both get 1. Find **all** the correlated equilibria of this game. Which are Nash and which are Pareto efficient?