Advanced Microeconomics

Final exam

Q1 True or False. No need to explain your answer.

1. In a second-price auction with (pure) common value, it is an equilibrium that every bidder bids exactly his valuation.

2. In a supply-function competition, an equilibrium outcome typically achieves a strictly lower expected social welfare than the team-efficient solution, because the condition for the optimal use of *private* information does not coincide with the condition for the socially efficient use of *private* information.

3. A sequential equilibrium requires that a belief system is consistent.

4. In a sequential equilibrium, every information set must be reached with a strictly positive probability.

5. Fix any Bayesian Nash equilibrium σ, and fix any belief system μ that is on-path consistent given σ. The combination (σ, μ) is a perfect Bayesian equilibrium.

Q2 Consider a private-value auction environment with n bidders. Each bidder i's valuation for the good $v_i \in [0, 1]$ follows a distribution with density $2v_i$. $v = (v_1, \ldots, v_n)$ is mutually independent.

1. Obtain the expected revenue for the seller in a second-price auction.

2. Consider the following auction rule (called an "all-pay" auction). Every bidder i simultaneously chooses $b_i \geq 0$; the highest bidder wins (in case of multiple highest bidders, each of them wins equally likely); and every bidder i pays b_i, *regardless of whether he wins or not.* That is, i's payoff is $v_i - b_i$ if he wins, and $-b_i$ if he loses. Assuming that there is an equilibrium where every bidder uses the same bidding strategy that

is strictly increasing, obtain the expected revenue for the seller in this auction.

3. Obtain a Bayesian Nash equilibrium of this game.