

Final Exam

Points for each problem are shown out of 180 points. Each subsection in a problem is weighted equally in grading. For problems C and D, please show the calculations used to arrive at your answers. Draw graphs neatly and label axes and points clearly. Round answers to the first decimal place if necessary.

A. (30 pts) Answer True, False, or Uncertain, and briefly explain your answer.

- (1) The market demand curve is generally flatter than the individual demand curves.
- (2) An equilibrium in dominant strategies is a Nash equilibrium.
- (3) If supply is completely elastic, then deadweight loss is only a loss of consumer surplus.
- (4) All Pareto-efficient equilibria are market equilibria.
- (5) The marginal cost curve always slopes upward.
- (6) In monopsony, the price is lower and the quantity lower than in perfect competition.

B. (30 pts) Short answers.

- (1) Given a demand curve $Q_D = 20 - 4P$, when the price changes from 3 to 4, what is the associated change in consumer surplus?
- (2) Draw a case where indifference curves would be nonconvex.
- (3) For the demand curve $Q_D = 20 - 4P$, find the equation for marginal revenue.
- (4) Describe two types of pricing strategies a firm might undertake if it were not forced to charge all customers the same unit price.
- (5) Give an original example of a production externality.
- (6) How might the prisoners' dilemma be avoided in repeated games?

C. (30 pts) A person has the utility function $U = \sqrt{XY}$.

- (1) What is the marginal rate of substitution between X and Y?
- (2) What is the demand function for X?
- (3) Given income $M = \$60$ and prices $P_X = \$4$, $P_Y = \$5$, graph the budget constraint.
- (4) What are the quantities purchased of X and Y?
- (5) The price of X changes to a two-tier system where in order to buy any amount of X, the consumer must first pay a \$5 charge and the per unit price of X is \$2.50. Graph the new budget constraint on the graph of (3).
- (6) Under this new pricing policy, will the consumer change the amounts purchased of X and Y? If so, what are the new quantities?

D. (30 pts) Two firms, A and B, both have costs $C(Q_i) = 15Q_i$. Market demand is $Q = 300 - 10P$;
 $Q = Q_A + Q_B$.

- (1) If this market were perfectly competitive, what would Q be?
- (2) If this market were operating as a cartel, what would Q be?

Now assume the market operates as a Cournot duopoly.

- (3) What is firm A's reaction function?
- (4) What is Q?

Now assume the market operates as a Stackelberg duopoly, and firm A leads.

- (5) What is firm A's profit function (simplify)?
- (6) What is Q?