

Final Exam

180 mins. Total of 180 points (points in parentheses).

1. (45) Consider returning to the club question on the second midterm. Suppose the two demand curves (for high demand and low demand consumers) are

$$P_h = 16 - Q_h$$

$$P_l = 12 - Q_l$$

and marginal costs of drinks is 4 dollars.

Now suppose the prof/club owner takes a different approach that does not involve carding the patrons. Instead, he offers “menu” options to each potential customer who comes to the front door. Consider the following menus:

- (a) A choice of entry plus 12 drinks for 120 dollars or entry plus 8 drinks for 64 dollars.
- (b) A choice of entry for 32 dollars which also gives them 8 tickets to buy drinks at 4 dollars per drink, or entry for 72 dollars which also gives them 12 tickets to buy drinks at 4 dollars per drink.
- (c) A choice of entry plus 8 drinks for 64 dollars or entry plus 12 drinks for 88 dollars.

For each of the menus determine whether or not they are incentive compatible, as defined in class. (in other words, it is incentive compatible if high demand consumers will not say they are low demand consumers if asked and low demand consumers will not say they are high demand consumers if asked.)

2. (35) Consider the two player game characterized by the table below.
- (a) Establish the dominant strategies for each player.
 - (b) Solve the nash equilibrium (or equilibria) of the game.

- (c) Now assume the game is played twice with payoffs for each player being the sum of payoffs in each period the game is played. Solve for the nash equilibrium (or equilibria) and solve for the subgame perfect equilibrium or equilibria.

	Defect	Cooperate
Defect	1,1	5,0
Cooperate	0,5	4,4

3. (30) Suppose the inverse demand curve for fax paper is given by $P = 400 - 2Q$. There are two firms who produce fax paper, and one of the firms has a cost advantage over the other. Firm 1's MC is 25 whereas Firm 2's is 40.

- (a) Derive the Cournot equilibrium outputs for each firm.
 (b) Derive the profits for each firm.

4. (45) Consider an industry where each firm has a cost function $C(q) = 256 + 20q$ and the market demand is $P = 100 - Q$ where Q is aggregate quantity.

- (a) Determine the equilibrium number of firms in the industry.
 (b) Determine the Lerner index for this industry.
 (c) To measure market concentration, determine the Herfindahl index as well as the index $C_{n/2}$ where n is your answer to the first part of the question. (if $n/2$ happens to not be an integer, then round it down.)

5. (25)

- (a) Define the difference between horizontal and vertical product differentiation.
 (b) Consider two different notebook, $N1, N2$, each with the following characteristics:

	Hard Drive (GB)	Screen Size	Speed (GhZ)	Weight	Price
N1	240	12	3	3	2000
N2	120	15	1	6	500

and two types of consumers, Student (S) and Business Person (BP), each with the following valuations of these characteristics.

	Hard Drive (GB)	Screen Size	Speed(GhZ)	Weight	Price
S	2	5	3	-1	-1
BP	5	2	5	-6	-1

Determine if the two notebooks are vertically or horizontally differentiated.