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Last Name (Please PRINT): .....

First Name (PRINT): .....

Your UM I.D. Number: .....

INSTRUCTIONS (please read!)

1. Please make sure that you have 7 pages, including this page. Complaints about missing pages will not be accepted.
2. Please answer all the questions. You are not allowed to use any course material. Calculators are permitted.
3. Maximum Time Allowed: 2 hours (08:00–10:00).
4. Your grade would depend on the arguments you develop for supporting your answers. Each answer must be justified by using a logical argument consisting of a model/graph. An answer with no justification will not be given any credit.
5. You must provide all the derivations leading to a numerical solution.
6. When you draw a graph, make sure that you label the axes with the appropriate notation.
7. Maximum Score: 100 Points
8. Budget your time. If you cannot answer a certain question, skip to the next one.
9. Please always bear in mind that "somebody" has to read and understand your handwriting. Please make sure that your ink is "visible" and that your sentences are properly organized and fit into the designated blank space. If you think that your handwriting is poor, please print each word!
10. Good Luck !

Instructor's use only

Problem #	1	2	3	4 & 5	6	7	Total
Maximum	15	15	20	20	10	20	100
Points							

(1a) [5 points] Explain the differences among horizontal, vertical and conglomerate mergers.

(1b) [10 points] What are the four types of innovations for which patents can be granted? What are the three requirements (criteria) that innovations must satisfy in order to be entitled to a patent?

(2) [15 points] The inverse demand functions for orange juice (O), grape juice (G), and tomato juice (T) are given by

$$q_O = 90 - 2p_O + p_G + p_T, \quad q_G = 100 - 2p_G + p_O + p_T, \quad \text{and} \quad q_T = 120 - 2p_T + p_O + p_G.$$

where p_O, p_G, and p_T denote the price of orange juice, grape juice, and tomato juice, respectively. The cost of producing one unit of orange juice, grape juice, and tomato juice, are the same and given by $c_O = c_G = c_T = 20$.

Assume that the ORANGADA company is the sole producer and seller of orange juice, and that the following market prices are observed: $p_O = 60$, $p_G = p_T = 40$.

Use the SSNIP test to determine which of the following markets should be considered as the "relevant market" for the ORANGADA company: (i) Orange juice only, (ii) Orange and grape juice, (iii) Orange, grape, and tomato juice, or (iv) broader market (more juices should be included).

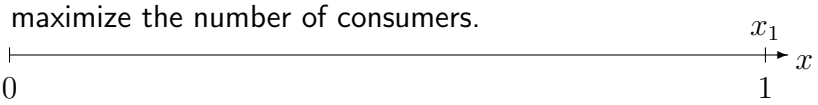
(3) The inverse demand functions for orange juice (O) and grape juice (G) are given by: $q_O = 24 - 2p_O + p_G$ and $q_G = 12 - 2p_G + p_O$, where p_O and p_G denote the price of orange juice and grape juice, respectively.

JUICIANA company is the sole producer and seller of both orange and grape juice. JUICIANA has no cost of production ($c_O = c_G = 0$), and maximizes the monopoly profit from selling in both markets, $\Pi = \pi_O + \pi_G$.

(3a) [10 points] Suppose that JUICIANA is restricted to setting a single uniform price for all juices, so that $p = p_O = p_G$. Compute JUICIANA's profit-maximizing price p, quantities sold q_O and q_G, and the resulting profit.

(3b) [10 points] Answer the above question assuming that JUICIANA is now free set different prices $p_O \neq p_G$ for the juices it sells. Which pricing policy (uniform versus nonuniform) yields a higher profit for JUICIANA?

(4) [10 points] Consider sequential entry of restaurants to the linear city which is the interval $[0, 1]$. Consumers are uniformly distributed on the linear street with one consumer at every point x, $0 \leq x \leq 1$. All restaurants charge the same price, so consumers go the restaurant closet to their location. Restaurants choose their location to maximize the number of consumers.



Suppose that restaurant 1 is already located on the right-most side of town. Formally, $x_1 = 1$. Then, after observing x_1, restaurant 2 chooses its location x_2, and only then restaurant 3 chooses x_3 after observing x_1 and x_2.

Solve for the subgame-perfect equilibrium locations of restaurants 2 and 3, x_2 and $x_3(x_2)$ and the restaurants' profit levels (number of customers). Make sure clearly specify the best-response function of restaurant 3.

(5) [10 points] The inverse market demand function for MP3 players is given by $p = 240 - 2Q$. Initially, firm A and firm B produce at equal unit cost, c_0. After investing heavily in R&D, firm A has managed to reduce its unit production cost to $c_1 = \$40 < c_0$. For which values of c_0, firm A's innovation can be classified as drastic (major), and for which values of c_0 the innovation is classified as nondrastic (minor). Prove your result using the definition.

(6) [10 points] The cost function of providing car rental services is given by $TC(Q) = 40 + 10Q$ where Q is the number of customers served (who each rents one car). All existing and potential firms have the same technology (hence, the same cost function).

The demand for car rental service in Inchilanti (a small town somewhere in the Midwest) is: $p = 22 - 0.5Q$. There is only one incumbent operator and many potential entrants. The incumbent firm would like to avoid competition from potential entrants. Compute the price charged by the incumbent firm and the quantity of service in a *contestable market equilibrium*.

(7) The inverse market demand for TOASTER-PHONEs in NYC is $p = 36 - Q$. The manufacturer licenses a single dealer to sell this brand in NYC. Therefore, the dealer acts as a monopoly in the NYC market. The manufacturer sells each TOASTER-PHONE to the dealer for $\$d \geq c$, where $c = \$20$ is the cost of producing one TOASTER-PHONE. In addition, the manufacturer may levy a fixed fee of $\$\phi$ on the dealership.

Consider a two-stage game in which in Stage I the manufacturer sets the per-unit price charged to the dealer d, and the fixed fee ϕ. In Stage II the dealer determines the quantity sold as to maximize the dealership's profit.

(7a) [5 points] Compute the dealer's price p, quantity sold Q, and profit π^d as a function of d and ϕ.

(7b) [10 points] Suppose the manufacturer does not charge the dealer any fixed fee, $\phi = 0$. Compute the dealer's price d which maximizes the manufacturer's profit. Then, compute the equilibrium consumer price p, and the profits made by the manufacturer π^m and the dealer π^d.

(7c) [5 points] Can the manufacturer set a different contract with the dealer so that both, the manufacturer and the dealer, make a higher profit. Formally, find d and ϕ which generates higher profit levels, π^m and π^d, compared to the levels you computed in (7b).

THE END