file=IO-Fall07-final.tex

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 (1:30–3:30).
4. Your grade depends 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 you 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 use only

Problem #	1	2	3	4	5	6	Total
Maximum	5	10	25	20	20	20	100
Points							

(1) [5 points] Which section of the antitrust law explicitly prohibits a incumbent firm to deter entry of another firm into the same industry? State this section and/or explain what the law says about this type of conduct.

(2) [10 points] Compute the profit-maximizing advertising budget for a monopoly firm using the following three important pieces of information:

i. The company is expected to sell \$50 million worth of the product.

ii. It is estimated that a 1% increase in the advertising budget would increase the quantity sold by 0.04%.

iii. It is also estimated that a 1% increase in the product's price would reduce quantity sold by 0.2%.

(3) Consider a monopoly cable TV operator with unit costs and potential subscribers described in the following table.

Consumer Type	CNN	BBC	HIS	# Subscribers
Type 1	\$11	\$2	\$3	$N_1 = 100$
Type 2	\$11	\$2	\$6	$N_2 = 100$
Type 3	\$2	\$11	\$3	$N_3 = 100$
Type 4	\$2	\$11	\$6	$N_4 = 100$
Marginal Cost	$\mu_C = \$1$	$\mu_B = \$1$	$\mu_H = \$1$	

The marginal cost of a channel is the fee that the cable operator must pay to the content provider of this channel for each consumer subscribed to this channel. Solve the following problems:

(3a) [10 points] Compute the operator's profit-maximizing subscription rates p_C, p_B, and p_H and the resulting profit π^{NT}, given that each channel is sold separately (no tying).

(3b) [10 points] Compute the profit-maximizing subscription rate p_{CBH} and the corresponding profit level π^{PT}, assuming that the operator offers only subscriptions for a single package composed of all three channels (pure tying).

(3c) [5 points] Can you find alternative packages that would generate a higher profit than that achieved by pure tying and no tying?

(4) The passengers' inverse demand functions facing an airline company during summer and winter are $p_S = 36 - q_S/2$ and $p_W = 36 - q_W$, respectively. The marginal operating cost is $c = \$2$, and the marginal capacity costs is $r = \$4$. Solve the following problems:

(4a) [10 points] Compute the summer and winter airfares assuming that this airlines implements a peak-load pricing structure.

(4b) [10 points] Suppose this airlines is not allowed to price discriminate between seasons and must fix the airfare throughout the entire year, so $p_{S,W} \stackrel{\text{def}}{=} p_S = p_W$. Compute the profit-maximizing season independent price $p_{S,W}$.

(5) A monopoly offers a product for sale. The product costs $c = \$10$ to produce. The product may fail with probability 0.2, hence it is fully operative with probability $\rho = 0.8$. This probability is public information in the sense that it is known to the seller and all buyers.

The product can either be fully functioning or totally defective. Consumers are willing to pay up to $V = \$40$ for a fully-functioning product. If the product is found to be defective, consumers do not gain any utility. Solve the following problems:

(5a) [5 points] Compute the monopoly price p^{NW} and profit π^{NW} assuming that the monopoly does not provide any warranty to customers.

(5b) [10 points] Compute the monopoly price p^{FW} and profit π^{FW} assuming that the monopoly provides a full-replacement warranty.

(5c) [5 points] Compute the monopoly price p^{PW} and profit π^{PW} assuming that the monopoly provides a partial cash-back warranty which states that the seller will pay $\phi = \$20$ to the consumer if the product is found to be defective.

(6) [20 points] The value of the patent for producing a pill which can cure the Michigan Flu is estimated to be around $V = \$16$ (all numbers are in millions of dollars). There is only one company in the entire world that invests in R&D in order to discover this pill. This company has to choose between two options:

Option A: Investing in **two** independent (expensive) labs. Each lab costs \$2 to operate. The probability that each lab independently discovers the pill is 0.75.

Option B: Investing in **three** independent (cheap) labs. Each lab costs \$1. The probability that each lab independently discovers the pill is 0.5.

Compute which option maximizes the expected profit of this firm?

THE END