# Practice Final Exam

**Rules:** Closed book, no notes other than the one page of formulas distributed with this exam. 180 minutes in class. Write your answers clearly on 8x11" paper in order (part I, then part II). Write your name on each page. Total Points = 100.

**Part I. Short answers.** 40 word maximum per question. "TFU?E" means "True, false or uncertain? Explain briefly." 6 points each.

1. Publishers of best-selling books typically price a hardcover edition at about $30 and then offer a paperback edition about a year later for about $15. Which of the following does this exemplify? List all relevant items.

a. Perfect price discrimination
b. Segmented markets
c. Signaling
d. Screening
e. One-sided private information (of buyers)
f. None of these apply

2. New internet advertising increases your company's demand elasticity with respect to price and also with respect to advertising, so it will pay to increase your advertising budget. TFU?E

3. In Rose City, all lumber yards advertise that they have the lowest price in town, and often offer to match the advertised prices of any other lumber yard. This is an example of Bertrand competition that brings about zero economic profits. TFU?E

4. Because firm managers are risk averse, an incumbent usually charges a higher price than a new entrant does. TFU?E

5. Your firm is planning to hold an auction to sell its mining facility. Which auction format would you recommend to maximize the price? Why?

6. Your company is launching a new internet dating service. How might limit pricing, predatory pricing or penetration pricing help you succeed? Pick one and explain very briefly.

**Part II. Problems**. Show work. Generous partial credit will be awarded for relevant fragments, but not when the fragment is buried in irrelevancies. Points as marked.

1. Airline analysts estimate that demand in the Bay Area for tickets to Los Cabos is usually given by $\ln Q = 23.1 - 2.0 \ln P + 0.1 \ln I$ where $P$ is the ticket price and $I$ is average customer income. However, when they analyze only data for students during spring break, the coefficient on ln $P$ becomes -3.0. Assuming that the estimates are correct and that airlines maximize profit, please find:

a. the income elasticity and own price elasticity for the usual demand; (4 points)
b. the airline's marginal cost if the usual ticket price is $360; (3 points)
c. the profit maximizing ticket price for students on spring break; (3 points)
d. ways to overcome the standard problems for charging a different price for different customers (in b and c). (3 points).

2. You are the CEO of Comchip, a firm that sells specialized computers. Each of the firm's computers contain a unique chip that is produced at Comchip's west coast plant at a cost of $C_W(Q_C) = Q_C^2$. Once produced, the chips are shipped exclusively to the firm's east coast plant. There, the computers are assembled, boxed, and shipped to the market at an additional cost of $C_E(Q) = 200Q$. An economic consultant recently estimated the (inverse) demand for Comchip's computers as $P = 5000 - Q$.

a. Determine the optimal quantity and price for computers, (5 points) and

b. explain how you can offer incentives to both plant managers to produce the required number of chips and computers. (5 points)

3. [Note: In 2012 the final exam will not have a question on bonus plans as challenging as this one, since we spent less time on the topic, but perhaps you will find it interesting anyway.]
The local herbal sleep-aid company ZZZ has hires you to review their bonus plan. The R&D manager had received an annual bonus (in $ thousands) of 2z, where z is the number of new products tested that year. You recommended basing the bonus on z – ½ y, where y = the average cost of active ingredients, instead of just z.
a. What is a good reason for your recommendation? (2 points)
b. What other sorts of recommendations regarding the bonus should accompany the switch from z to z – ½ y? (3 points)
c. A year later ZZZ tells you that the R&D manager's impact on profits has become stronger, due to the entry of copy-cat products. What sort of adjustment should you recommend for the bonus? (2 pts)
d. The following year, the R&D manager becomes more risk-averse due to starting a family. What sort of bonus adjustments are appropriate? (2 pts)
e. Recently the R&D manager was also given the responsibility of supervising field botanists. Performance is hard to measure since the botanists are often traveling in remote places. How will the new responsibility affect your recommendation about bonuses? (3 pts)

4. Stints are a standardized device produced by only two firms. Each of the firms independently chooses how many to produce, say $Q_1$ and $Q_2$, and price is determined by the (inverse) market demand curve $P = 280 - 2(Q_1 + Q_2)$. Currently the firms' costs are $C_1(Q_1) = 3Q_1$ and $C_2(Q_2) = 2Q_2$.
a. Determine the marginal revenue for each firm. (4 points)
b. Determine the reaction function for each firm. (4 points)
c. What are the equilibrium output choices, price and profits for each firm? (4 points)
d. Firm 2's cost advantage is due to a subsidy granted by its home state. How much would Firm 1 be willing to pay (say in campaign contributions) to remove the subsidy and thus increase firm 2's costs to $C_2(Q_2) = 3Q_2$? (4 points)

5. Slug Insurance (SI) is planning to sell policies to 20,000 UCSC and Cabrillo students. They estimate that 80% of the students are low risk with average health costs $C_L$ = $1000 per year and standard deviation = 1000. The other 20% are high risk with average health costs $C_H$ = $2000 and standard deviation = 4000. All students have risk aversion coefficient r = 0.0002. SI is a risk neutral, for-profit company with negligible overhead costs. It can't tell whether an individual student is low or high risk.
a. Compute the willingness to pay for health insurance by each type of student, L and H. (4 points)
b. What annual premium (price of an insurance policy) would allow SI to break even, if all students joined? (3 points)
c. SI is thinking about charging $400 above that break-even point. At that premium, which students would find it worthwhile to join SI, and what will be SI's profits? (4 points)
d. How can SI adjust their strategy to increase profits? How much could they make? (2 points).