Homework 2  
Managerial Economics  
MBA, NCCU  

1. Consider a company that manages a network of hospitals across several counties in one state. Household incomes and the cost of living are higher in urban than rural areas. The company, however, has set the same prices for pharmaceuticals and services in all of its hospitals. It has also paid the same salaries for doctors, nurses, and other professional staff throughout the state.  

(A) Management has noticed that there are long waiting lists for treatment at its urban hospitals. Can you explain this problem? Graph is required.  
(B) The company has had great difficulty in recruiting professional staff for its urban hospitals. Can you explain this problem? Graph is required.  

2. Congress and the president decide that the United States should reduce air pollution by reducing its use of gasoline. They impose a $0.50 tax for each gallon of gasoline sold.  
(A) Should they impose this tax on producers or consumers? Explain carefully using a supply-and-demand diagram.  
(B) If the demand for gasoline were more elastic, would this tax be more effective or less effective in reducing the quantity of gasoline consumed? Explain with both words and a diagram.  
(C) Are consumers of gasoline helped or hurt by this tax? Why?  

3. Suppose that MM system operates two call centers: A and B. Table reports the total costs at the two centers for various rates of customer service.  

<table>
<thead>
<tr>
<th>Service Rate(calls/day)</th>
<th>Total costs from A center</th>
<th>Total costs from B center</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>$5000</td>
<td>$8000</td>
</tr>
<tr>
<td>2000</td>
<td>$11000</td>
<td>$16000</td>
</tr>
<tr>
<td>3000</td>
<td>$18000</td>
<td>$24000</td>
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<tr>
<td>4000</td>
<td>$26000</td>
<td>$32000</td>
</tr>
<tr>
<td>5000</td>
<td>$35000</td>
<td>$40000</td>
</tr>
</tbody>
</table>

To serve a total of 5000 calls per day in the cheapest way, how many calls should the company serve from A center and how many from B center? Explain why.
4. Qantas operates a fleet of over 100 Boeing jet aircraft. Commercial passenger jets must be operated by a pilot and co-pilot. Many jets carry cargo in their "bellies", under the passenger seating areas. Consider each of the following costs. Identify which are joint costs of passenger and belly cargo services, which are fixed costs of passenger service, and which are both.

(A) Cockpit personnel: All jets, large and small, require a pilot and co-pilot. Belly cargo service requires no additional officers in the cockpit.
(B) Airport landing fees: Some airports charge landing fees by weight of the aircraft, while others levy a fixed fee, regardless of weight.
(C) Fuel: Larger aircraft and those carrying heavier loads will consume relatively more fuel.

5. In 2004, U.S. consumer products manufacturers distributed 27.548 billion coupons, with a face value of over $280 billion, of which a mere 1.2% were redeemed by consumers. Why do manufacturers spend millions of dollars to distribute coupons when the redemption rate is so low? Why don’t they manufacturers directly cut the wholesale prices of the products, which would be much cheaper to administer?

(A) Some say that retailers would absorb a direct wholesale price cut instead of passing it on to consumers. They argue that, by contrast, retailers cannot absorb the value of coupons. Suppose that the retail sector is perfectly competitive. Compare the demand-supply equilibrium in the retail market with (i) a wholesale price cut of 50 cents and (ii) widespread distribution of 50-cent coupons. For this part, you may assume that all consumers use coupons.

(B) Would there be any difference between the wholesale price cut and using coupons if the retailer were a monopoly?
6. For many years, the NBA had a monopoly over basketball and, consequently, monopsonized the market for players. This monopsony over players began to erode in 1967 with the formation of the ABA. Finally, in 1983, basketball team owners agreed to allow free agency, which removed the restrictions against players moving between teams. An analysis of earnings showed that a player who scored 10% more points would have earned 2.05% more salary between 1968 and 1975, but 3.21% more salary between 1984 and 1988.

(A) Explain the connection between having a monopoly over basketball and a monopsony over basketball players.

(B) Compare the wage rate when the demand side of the market is a monopsony with the perfectly competitive wage.

(C) Explain the differences in player earnings between 1968-75 as compared with 1984-88.

(D) When the ABA and NBA proposed to merge, the basketball players opposed the proposal. Explain why.

7. Suppose that Iron Music has the copyright to the latest CD of the heavy Iron band. The market demand curve for the CD is \( Q = 800 - 100P \), where \( Q \) represents quantity demanded in thousands and \( P \) represents the price in dollars. Production requires a fixed cost of $100,000 and a constant marginal cost of $2 per unit.

(A) What price will maximize profits?

(B) At that price, how will be the sales?

(C) What is the maximum profit?

(D) Calculate the Lerner Index at the profit-maximizing scale of production.

(E) Suppose that the fixed cost rises to $200,000. How would this affect the profit-maximizing price?
8. Referring to the following figure, suppose that Mercury Airlines’ marginal revenue and demand curves cross the marginal cost curve at quantities of 3,000 and 6,000 seats a week, respectively. All other data remain the same.

(A) Calculate the profit under policies of (i) uniform pricing, and (ii) complete price discrimination.
(B) Suppose that Mercury implements complete price discrimination. Explain why it should sell up to the quantity where the buyer’s marginal benefit equals Mercury’s marginal cost.
(C) Explain why Mercury’s profit is higher with complete price discrimination than with uniform pricing.

9. The demand for most new films is highest in the first few days after opening, then tapers off. Two key factors affecting potential demand are the season (the Summer and Christmas vacation periods are the best times) and the timing of other releases. Suppose that both Studio Luna and Moonlight Movies are producing major action movies.

(A) The two studios simultaneously must choose between release on December 11 or 18. If both films open on December 11, each will sell 200,000 tickets. If one opens on December 11 and the other on December 18, then the early release will sell 350,000 tickets, while the later release will sell 150,000. If both open on December 18, each will sell 100,000 tickets. Construct a game in strategic form to illustrate the situation and identify the equilibrium or equilibria.
(B) Now suppose that the publicity surrounding one movie will increase the demand for the other film. Specifically, each studio will sell 70,000 more tickets if both open on the same day. Adjust the data in (A) according to this new information. How does this affect the equilibrium or equilibria?

10. Dial-up Internet users need modems to convert digital data into analog signals and Internet access providers (IAPs) need matching modems to convert the analog signals back to digital data. In the mid-1990s, the dominant standard for modems was the V.34, providing a speed of 28.8 or 36.6 kilobits per second (kbps). In Autumn 1996, two incompatible technologies for 56 kbps modems – Rockwell’s K56Flex and U.S. Robotics’s X2 -- were launched.

(A) Construct the following game in strategic form. End-users choose among the three alternatives of buying K56Flex, buying X2, or remaining with the old technology, while IAPs have the same choice. If both end-users and IAPs choose K56Flex, each group receives a net benefit of 100, and similarly, if both groups choose X2. If end-users or IAPs buy K56Flex or X2, while the other does not buy the matching technology, the buyer receives a net benefit of –50. Anyone that remains with the old technology receives 0. Identify the equilibrium/equilibria in pure strategies.

(B) In February 1998, Rockwell and U.S. Robotics agreed on a common V.90 standard. How did this affect the game and its equilibrium/equilibria?