Midterm Exam

June 20, 2017

Name_____

Instructions. Please read all questions carefully, use your time wisely and show your work and final answers clearly. I don't grade on neatness but if I can't read it, I can't give credit for it. Also, algebra mistakes may be forgiven or at least not punished severely but only if you show clearly that you understand how to solve the problem. Your answers should be complete and clear but excessive length should be avoided.Calculators are allowable.

1. a. A hospital executive looks at the performance review for the divisions of his hospital and sees that in the maternity division last year there were 540 babies delivered at a cost of $3,132,000 with a revenue of $2,754,000. What decision should the administrator make in regard to encouraging the maternity division to increase or decrease the number of babies delivered? If a decision can not be reached from this information alone, explain what information is needed and what might lead to a choice to increase or a choice to decrease the number of deliveries.(7 points)

b. Your 7-year old self reads that after getting their allowance, most 7-year-olds exhibit behavior consistent with Cobb-Douglas preferences over two goods, candy and ice cream. You get $20 in allowance every week. You remember buying 10 candies and 5 ice creams last week, and you paid $0.90 per candy. However, you cannot remember the price of an ice cream. Yet with the information you recall, you realize that you can figure out the utility function that generated your behavior and recover the price of ice cream. What is the utility function and price of ice cream? (7 points)

2. A TV station is considering distributing a promotional video. There are two suppliers who are willing to produce it. Supplier A will charge the station a setup cost of $1,200 and then $2 for each DVD ordered. Supplier B will charge $4 per DVD with no setup charge. The station believes that the demand function will be $Q = 1600 - 200P$.

a. Suppose the station wants to maximize viewership and so wants to give the videos away for free. How many videos should the station order to satisfy demand and from which supplier should they be ordered? (8 points)

b. Suppose the station instead wants to maximize profits by selling the videos. What price should it set, how many will they sell and which supplier should they order from? (8 points)

3.

a. Definition of "indifference curve"; Properties of "indifference curve"; (7 points)

b. Explain the difference between "long run" and "short run" costs. Explain the types of decisions a firm might make that distinguishing between these two contexts is important. (4 points)

c. Explain the relation between Average Product Curve and Marginal Product Curve. (4 points)

4. In a competitive market the supply and demand curves are given by

$$\begin{aligned} Q_D &= 70 - P \\ Q_S &= .5P - 20 \end{aligned}$$

a. Find the equilibrium price and quantity. (6 points)

b. Suppose the government subsidizes the producers by paying them \$15 per unit produced. Determine what happens to the equilibrium price and quantity. (7 points)

c. Evaluate the effects on social welfare from this subsidy. Is it good for producers? Consumers? Society as a whole? Think through your answer carefully and explain why it comes out as it does. (*For full credit, provide quantitative answers. Partial credit will be given for accurate graphical arguments. Tip: area of a triangle is .5*base*height.)*(15 points)

5. Suppose you are selling a product and know that you face two different types of consumers with inverse demand functions for representative consumers of each type given by $p_1 = 8 - 2q_1$ and $p_2 = 4 - .5q_2$. Assume that marginal cost is 2.

a. Find the profit maximizing price and quantity per consumer as well as profit per consumer were you to sell to each group individual items at different prices (i.e. different prices to each group, not different per item). *(6 points)*

b. What if instead of selling single units, you were to only sell units in bundles of 2, 3 or 4 units? Assume you can sell in one of those bundle sizes and then you sell the same bundle size to both groups at the same price. Find the optimal bundle size and profit level. (*Hint: This one is tricky and we didn't do one exactly like it before. If you can't solve the mathematics fully, provide a clear explanation for how you would find the answer.) (7 points)*

c. The table below shows the value two different types of consumers have for services at a hotel as well as the marginal cost of each service and the number of consumers of each type. Find the price the hotel would sell each service for if the services were separately priced. Calculate total profit. *(7 points)*

	Room	Breakfast	Gym	Number
Type 1	\$100	\$5	\$10	200
Type 2	\$60	\$10	\$10	800
Marginal Cost	\$40	\$2	\$0	

d. Determine what the optimal bundle price would be for combining all three services and determine if the hotel should bundle or sell separately. *(7 points)*