PROBLEM SET 5 – Tutorial Week 8 (October 3–7)

Deadline: 11:59 p.m. two days before your tutorial. Please submit a PDF in groups of 2–3 within your tutorial group. On the first page, write your full names (as on the roster) in alphabetical order. Start each question on a new page. Name your PDF "PSet # – LastName LastName LastName," e.g., "PSet 5 – Banerjee Duflo Kremer." Points will be deducted for not adhering to the instructions. You only need to submit your answers to Section B.

Section A

1. Classify the following markets as perfectly competitive, monopolistic, or monopolistically competitive, and explain your answers.
   Note: The point of this question is for you to be able to reasonably justify your answers.

   (a) aluminum
   (b) beer
   (c) electricity
   (d) peanut butter
   (e) safety pins
   (f) deodorant

2. Consider total cost and total revenue given in the table below:

Quantity	Total Cost ($)	Total Revenue ($)
0	2	0
1	3	10
2	5	18
3	8	24
4	12	28
5	17	30
6	25	30
7	35	28

   (a) Calculate profit for each quantity. How much should the firm produce to maximize profit?
   (b) Calculate marginal revenue and marginal cost for each quantity. Graph them. *(Hint: Put the points between whole numbers. E.g., the marginal cost between 2 and 3 should be graphed at 2.5.)* At what quantity do these curves cross? How does this relate to your answer to (a)?
   (c) Can you tell whether this firm is in a competitive industry? If so, can you tell whether the industry is in a long-run equilibrium?

3. Read the excerpts from Tim Harford's *The Undercover Economist*, Chapter One. What is rent? What are the different reasons for high rent?

4. A large share of the world supply of diamonds comes from Russia and South Africa. Suppose that the marginal cost of mining diamonds is constant at $\$5{,}000$ per diamond, and that $MC = ATC$. The demand for diamonds is described by $P = 40{,}000 - Q$. The demand schedule is:

Price	Quantity
$35,000	5,000
$30,000	10,000
$25,000	15,000
$20,000	20,000
$15,000	25,000
$10,000	30,000

   (a) If there were many suppliers of diamonds, what would the price and quantity be?

   (b) If there were only one supplier of diamonds, what would the price and quantity be? *(Hint: Take the first derivative of TR to find MR.)*

   (c) If Russia and South Africa formed a cartel, what would the price and quantity be? If the countries split the market evenly, what would South Africa's production and profit be? What would happen to South Africa's profit if it increased its production by $2{,}000$ while Russia stuck to the cartel agreement?

   (d) Use your answer to (c) to explain why cartel agreements are often not successful.

   (e) Identify the concepts highlighted in this question.

5. Read the following article:
   The Atlantic. May 2017. "How Online Shopping Makes Suckers of Us All."
   https://www.theatlantic.com/magazine/archive/2017/05/how-online-shopping-makes-suckers-of-us-all/521448/

   (a) What concepts can you identify in this article?

   (b) What are the advantages of fixed prices?

   (c) What were the two developments that loosened the head merchant's hold on prices?

   (d) What is the "left-digit bias"? Does it exist?

   (e) According to the article, what does the price of the headphones recommended by Google depend on?

6. Read the following article:
   The Economist. May 6, 2017. "Price-bots can collude against consumers."
   https://www.economist.com/finance-and-economics/2017/05/06/price-bots-can-collude-against-consumers
   (a) What are the conditions that allow for tacit collusion? For each condition, explain what will happen if that condition is not met.
   (b) Which of the conditions are exploited by price-bots? How?
   (c) One possible solution is to allow consumers to deal directly with price-bots. What is the downside to this solution?

Section B

1. (a) Explain why a monopolist will always produce a quantity at which the demand curve is elastic. *(Hint: Assume that MC is positive, which is almost always true.)*
   (b) Why is a monopolist's marginal revenue less than the price of its good?
   (c) Can marginal revenue ever be negative? Explain.

2. The demand for cheeseburgers in FASS takes the form $P = 60 - 4Q$, where Q is the quantity demanded per day. The average and marginal costs of producing cheeseburgers are constant at $\$4$.
   (a) The Blue Room, by virtue of a license granted by the university, has a monopoly on the production of cheeseburgers in FASS. What is the Blue Room's profit-maximizing level of production? What price will it charge? Calculate its profits. Use a graph to illustrate your answer. *(Hint: Take the first derivative of TR to find MR.)*
   (b) The university withdraws its license, and other firms enter, making the cheeseburger industry perfectly competitive, with the same cost structure as the monopolistic Blue Room. What quantity will a competitive industry produce? What price will it charge? Indicate this price and quantity on your graph in (a).
   (c) What are the welfare effects of a monopoly in cheeseburgers? Show the deadweight loss of the monopoly on your graph in (a) and calculate its value.
   (d) How would your answer to (c) change if a monopolist were able to perfectly price discriminate in the cheeseburger market? What conditions would have to exist to allow perfect price discrimination to occur?

3. Watch Pixar's four-minute animation *One Man Band*:
   https://vimeo.com/15914491
   Describe in no more than five sentences how the animation illustrates market structures.

4. You are hired as a consultant to a monopolistically competitive firm. The firm reports the following information about its price, marginal cost, and average total cost for a given level of output. Can the firm possibly be maximizing profit? If the firm is not maximizing profit, what should it do to increase profit? If the firm is maximizing profit, is the firm in a long-run equilibrium? If the firm is not in a long-run equilibrium, what will happen to restore long-run equilibrium?

   (a) $P = 10, MC = 10, ATC = 6$

   (b) $P = 12, MC = 10, ATC = 12$

   (c) $P = 11, MC = 8, ATC = 10$

   (d) $P = 10, MC = 12, ATC = 8$

   (e) $P = 8, MC = 5, ATC = 10$

5. In a small Nevada town, Ptomaine Flats, there are only two restaurants, the Road Kill Café and, for Italian fare, Sal Monella's. Each restaurant has to decide whether to clean up its act or continue to ignore health code violations. Each restaurant currently makes $7,000 a year in profit. If they both tidy up a bit, they will attract more patrons but must bear the (substantial) cost of the cleanup; so they will both be left with a profit of $5,000. However, if one cleans up and the other doesn't, the influx of diners to the cleaner joint will more than cover the costs of scrubbing; the more hygienic place ends up with $12,000, and the grubbier establishment incurs a loss of $3,000.

   (a) Show the payoff matrix for this game, clearly labeling strategies and payoffs to each player.

   (b) What is each player's dominant strategy?

   (c) What will be the outcome of the game? Explain.

   (d) Suppose the two restaurants believe they will face the same decision repeatedly. How might the outcome differ? Why?

   (e) Identify the concepts highlighted in this question.

6. Read the following article:
   The Economist. April 12, 2017. "The University of Chicago worries about a lack of competition."
   https://www.economist.com/business/2017/04/12/the-university-of-chicago-worries-about-a-lack-of-competition

   (a) Why is lack of competition a problem?

   (b) What are the signs that competition in the economy has weakened significantly?

   (c) Why has competition in the economy weakened significantly?

   (d) Is the technology industry competitive?