Homework Exercises 7: Monopoly

Question 1

Warmfuzzy Press owns the copyright for the best-selling book, *Burping Your Inner Child*. Below is its demand and cost information:

Q (No. of Copies)	*P* ($ per book)	*ATC* ($ per book)
100,000	100	20
200,000	80	15
300,000	60	16.67
400,000	40	22.50
500,000	20	31

a. What quantity should Warmfuzzy print, and at what price, to maximize profit?
b. What is Warmfuzzy's maximum profit?
c. Suppose that before publishing, the author negotiates a $1,000,000 one-time bonus (not included in the original costs). Should Warmfuzzy print a different number of books now? Explain your answer.

Question 2

Bleyer Industries Inc. was the only U.S. maker of plastic Easter eggs, producing 250 million eggs a year. But after imports from China increased, Bleyer went bankrupt because Chinese companies made eggs more cheaply[1]. Use graphs to show how a competition from imports can force a monopoly out of business.

Question 3

The government regulates a monopoly by setting a maximum price, i.e. price ceiling. Sometimes the monopoly might try to convince regulators its costs are higher than they really are (overstate its costs). Suppose the government sets a price ceiling at a certain amount, $\bar{p}$, which is *between* the regular monopoly price and the "efficient" price (where marginal cost = demand). Explain what happens to output and total market benefits when the government sets this maximum price.

Question 4

People say the music industry is inefficient: once a song is produced, the company that owns it has a monopoly (because of copyright) and charges the monopoly price. But the cost of giving one more person access to the song online is basically zero. Draw a diagram to represent this situation. Identify on your diagram:

a. The output level the unregulated industry actually produce
b. The efficient output level
c. The output level if the government allowed the music industry to charge just enough to earn a "fair rate of return".

Question 5

In the short run, a monopoly uses both fixed and variable inputs to produce its output.

a. Draw a diagram showing a monopoly earning zero economic profit (breaking even).
b. Change your graph to show what happens if the price of a fixed input rises. Explain why the monopoly's price and quantity do not change.

[1] Source: U.S. Plastic Egg Industry a Shell of its Former Self, *San Francisco Chronicle*, January 14th, 2005.

Question 6

Suppose that Patty's Pool has the demand data given in the following table. Drug prices in the U.S. are usually two to three times higher than in other rich countries. One reason is that there was no government regulation of drug prices until recently.

Aimed at reducing drug prices, a new policy now allows Medicare (the government's health insurance program) to "negotiate" drug prices directly with pharmaceutical firms. However, this so-called "negotiation" is very one-sided: pharmaceutical firms must accept the prices set by Medicare officials, or else they cannot sell their drugs to Medicare patients. The industry has strongly opposed these regulations, suggesting the new rules may impact the types of drugs developed and deter innovation[2].

a. In America, patented drugs are sold by companies with monopoly power. Draw a diagram and explain how a pharmaceutical firm determine its output level and price for its patented drugs, when there is no government regulation of prices.
b. On your diagram from part (a), clearly show the areas that represent consumer surplus and producer surplus. Explain whether the market outcome is economically efficient.
c. Suppose the government wants the pharmaceutical firms to produce the efficient output level. Using your diagram, explain how the government should set the price and why the firm would be induced to produce the efficient output level.
d. Discuss possible effects this regulation could have on the development of new drugs and innovation by pharmaceutical firms.

Question 7

China spends a much higher share of its health budget on medicines – 40%, compared to an OECD average of 16%. One major reason is high drug prices. Most Chinese hospitals are public and sell about 80% of all medicines (near-monopoly). However, government subsidies make up only 9% of hospital revenues (as of 2011), while medicine sales account for 40%. Because hospitals need income to cover medical services, they aim to maximize profits from selling drugs.

To try to control drug costs, the Chinese government introduced a rule: hospitals can only charge a maximum 15% markup above costs of drugs they sell. However, this price control created some unexpected problems. For example, doctors started prescribing more expensive drugs or unnecessary medicines to increase hospital income. As a result, Chinese people now use ten times more antibiotics, on average, than Americans[3].

a. Suppose the Chinese medicine market is a monopoly. Draw a diagram and explain how a hospital decides the price and output level for medicines, when there is no government price rule.
b. Using a diagram, explain how price controls (like the 15% markup limit) affect the market for medicines in Chinese hospitals. (Hint: Assume that the regulated price is lower than the monopoly price without government rules.)
c. Explain possible reasons why hospitals and doctors started prescribing more expensive drugs or unnecessary drugs under this price controls (the 15% markup limit).

[2] Source: A bitter pill, *The Economist*, August 29th, 2023.
[3] Source: Physician, heal thyself, *The Economist*, February 1st, 2014.

Question 8

a. In 2024, Apple' 13-inch MacBook Air (M2) costs $1,099 for regular buyers but $999 for college students and faculty through Apple's Education Store. Why does Apple charge different prices for the same laptop?

b. Between 2012 and 2017, Apple sold a special low-spec iMac for $999 exclusively to schools and universities. This "Education only" model had lower hardware specifications and was not available to individual consumers. Was Apple practicing price discrimination in this case? Explain your reasoning.

Question 9

Patty's Pool, a monopoly in a small town, has the following demand data:

Q (swimmers per day)	*P* (admission fee $)	*TR*	*MR*
0	13	0	
1	12	12	12
2	11	22	10
3	10	30	8
4	9	36	6
5	8	40	4
6	7	42	2
7	6	42	0
8	5	40	-2
9	4	36	-4

Patty pays $24 rent per day (fixed cost) and $5 per swimmer for towels and other services (variable cost). [*Hint:* What's Patty's marginal cost?]

a. If Patty charges the same price to all swimmers (single-price monopoly), what output and price maximize her profit? What is her daily profit/loss? Should she stay in business in the long run if rent stays the same?

b. Suppose Patty can exercise price discrimination by spliting swimmers into two groups: Group 1 pays the price from part (a), and Group 2 (i.e. who are not willing to pay the price from part (a)) would pay $5. Now what is Patty's profit-maximizing output, price(s), and daily profit/loss? Should she stay in business long term? [*Hint:* Be sure to recalculate the *TR* and *MR* numbers to answer this question. Also if Patty is indifferent between two output levels, choose the higher one.]

c. Now Patty can charge three different prices: $10 (high), the price from part (a) (medium), and $5 (low). What is her profit-maximizing output, prices, and daily profit/loss? Should she stay in business long term?

d. If Patty can perfectly price discriminate (charge each swimmer their maximum willingness to pay), what is her profit-maximizing output and profit/loss? Should she stay in business long term?