

**MONOPOLY, EXTERNALITIES AND PUBLIC GOODS**

Graded satisfactory (2% of course grade) or unsatisfactory (0% of grade).

Satisfactory means a serious attempt made to answer the questions. Your answers need not be lengthy. No credit for late assignments. Academic honesty is required.

1. A (monopolist) firm faces the following demand curve:

|          |      |      |      |      |      |      |
|----------|------|------|------|------|------|------|
| Price    | 5.00 | 4.50 | 4.00 | 3.50 | 3.00 | 2.50 |
| Quantity | 1    | 2    | 3    | 4    | 5    | 6    |

The firm has fixed costs of \$2.00 and the following marginal cost curve:

|               |      |      |      |      |      |      |
|---------------|------|------|------|------|------|------|
| Quantity      | 1    | 2    | 3    | 4    | 5    | 6    |
| Marginal cost | 1.50 | 1.00 | 1.50 | 2.00 | 2.25 | 2.50 |

- Obtain the marginal revenue curve for the firm. (Hint: First find total revenue).
- If the firm acts as a monopolist, what level of output will it produce?
- At this level of output, what is the amount of the profit or loss made? (Hint:  $TC = FC + VC$ , where variable costs are the sum of marginal costs).
- If the firm instead chooses a level of output where marginal cost equals price, as in the case of perfect competition, what level of output will it choose?

2. Easy and Greasy is the only seller of hamburgers in an isolated town. The daily demand curve for hamburgers is

$$P = 5 - 0.01Q$$

where  $Q$  is measured in number of hamburgers and  $P$  is measured in dollars. It can be shown that the corresponding marginal revenue curve is (approximately):

$$MR = 5 - 0.02Q.$$

Daily total costs are given by:

$$TC = 125 + 2Q.$$

- Draw the appropriate diagram for determining Easy and Greasy's production. (Note: You need to get the marginal cost curve).
  - What is the profit maximizing level of output for hamburgers?
  - What will be the price of hamburgers and the level of profit?
3. We consider the social costs of the monopoly in the preceding question.
- Calculate the producers surplus.
  - Calculate the consumers surplus.
  - Calculate the deadweight loss due to monopoly.

4. Consider an economy with only two goods -- food and shelter -- produced using capital and labor. There are many consumers, many producers of shelter, but only one producer of food. Explain in some detail why a Pareto inefficient allocation will arise.

5. A local coffee company roasts coffee beans in its shop. There are two components to the firm's marginal costs. First, unroasted beans cost the company \$2.00 per pound (or 200 cents). Second, the marginal cost of roasting the beans is a function of how much it roasts,  $MC = 100 + 5Q$ , where cost is in cents. Unfortunately, the smell of the roasting beans imposes costs on the neighbors of the shop. The marginal damage imposed on neighbors by roasting depends on how many pounds are roasted:  $MC = 5Q$ , where cost is again in cents. The company sells its output in a perfectly competitive market for \$5.00 per pound.

(a) Without any regulation, how much coffee does the company sell?

(b) What is society's marginal cost for the last pound roasted and sold?

(c) What is the efficient output of this company?

(d) All producers in the coffee industry have the same cost curves as this local coffee company and impose the same externality. At the efficient outcome will the price of coffee be more or less than \$5.00 per pound? Explain your answer using an appropriate diagram.

6. Consider an economy with two goods -- food and shelter -- produced using capital and labor. There are many consumers, and many producers of both food and shelter.

(a) The production of shelter produces a negative externality, due to the loud noise made in construction. Explain briefly why a Pareto inefficient allocation of food and shelter will arise.

(b) Now suppose there is no externality problem. Instead due to lack of property rights there is no way to limit use of the shelter, and shelters are large enough that consumption of shelter is nonrival. Explain briefly why a Pareto inefficient allocation of food and shelter will arise.

7. State whether each of the following government activities is or is not associated with adjustment to an externality or provision of a public good.

(a) Federal government provision of regional weather forecasts.

(b) Payment of medical expenses for the elderly.

(c) ASUCD provision of Davis bus system.

(d) Payment to farmers to maintain prices of agricultural commodities.

**For this problem set you need to read:**

**Chapter 13.1-13.3**

**Chapter 18.1-18.3.**