

ECON 310

Assignment #4

**Due: Wednesday, November 7 at 9:00 am**

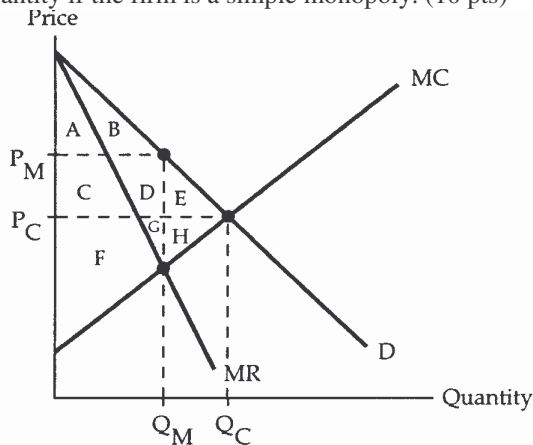
Please write your answers on a separate piece of paper and show all of your work.

Please write legibly!

1. A firm has the production function  $Q = L^{2/3}K^{1/3}$ . Using calculus, the  $MPL = 2/3 L^{-1/3}K^{1/3}$ , and the  $MPK = 1/3L^{2/3}K^{-2/3}$ . The wage rate is \$4 per hour and the rental rate is \$2 per hour. The firm decides to spend \$60 on its inputs. (10 pts)

- What is the optimal level of  $K$ ?
- What is the optimal level of  $L$ ?
- What is the firm's total level of production ( $Q$ )?
- Graph the entire situation. Label both curves, including endpoints, and indicate the optimal bundle.
- Does this production function  $Q = L^{2/3}K^{1/3}$  exhibit increasing, decreasing, or constant returns to scale?

2.  $P_C$  and  $Q_C$  are the equilibrium price and quantity if the firm behaves competitively, and  $P_M$  and  $Q_M$  are the equilibrium price and quantity if the firm is a simple monopoly. (10 pts)



- What area represents the producer's surplus earned in the monopoly equilibrium? \_\_\_\_\_
- Suppose this firm initially acted competitively. If the firm switched to the simple monopoly equilibrium, how much deadweight loss would be created? \_\_\_\_\_
- The difference between producer's surplus as a simple monopolist and producer's surplus if the price was set at the competitive equilibrium is: \_\_\_\_\_
- Suppose the firm could perfectly price discriminate. The difference between consumer surplus under a simple monopoly scenario and consumer's surplus under the perfect price discriminating monopoly scenario is: \_\_\_\_\_
- Suppose the firm could sell some of its product in a different city for the competitive market price. Should the firm sell more or less than  $Q_M$  in its local market? Label the new quantity  $Q_n$  on the graph above.

3. Chapter 12, Problem Set # 1-5. **NOTE: Do Only For Game matrices IV-VIII.** (25 pts)

4. Multiple Choice (5 points)

(1 pt each)

- The initial holdings of an individual in an Edgeworth box is referred to as
  - the contract point.
  - the endowment point.
  - the Pareto preferred point.
  - the competitive equilibrium point.

- ii. In an Edgeworth box, a point where two indifference curves are tangent represents
  - a. the initial endowment point.
  - b. an allocation that both consumers prefer to the initial endowment.
  - c. a competitive equilibrium.
  - d. a Pareto-optimal allocation of goods.
  
- iii. Analysis of an Edgeworth box economy shows that a competitive equilibrium
  - a. must be Pareto optimal.
  - b. can be located anywhere along the contract curve.
  - c. may lie anywhere within the region of mutual advantage.
  - d. must lie to the southeast of the endowment point.
  
- iv. In order to practice *any form* of price discrimination, a monopoly must be able to
  - a. identify the maximum price that each customer is willing to pay.
  - b. separate its customers into distinct groups.
  - c. prevent resale of its product.
  - d. establish a legal barrier to entry.
  
- v. Second-degree price discrimination generally takes the form of
  - a. special prices for students and seniors.
  - b. membership clubs.
  - c. quantity discounts.
  - d. “extras” like free delivery and free customer service.