# Intermediate Microeconomics Exercise Class 6 

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## Content

(1) Concepts Review

(2) Additional Questions

## Different Forms of Market

- Perfect Competition
- A perfectly competitive firm is a price taker
- $M R=P$
- Shape of the Demand Curve for a Perfectly Competitive Firm Horizontal (perfectly elastic)


## Perfect Competition

- Profit Maximization in the Short-Run: $M C=M R=P$
- In the Long-Run: $P=M C$
- $\pi>0$ : Entry of new firms
- $\pi<0$ : Exit of existing firms
- $\pi=0$ : No firms enter or leave the market $\Rightarrow$ Perfectly competitive equilibrium
- $P=M C=M R=A C_{\text {min }}$


## Perfect Competition Cont'd

- Long-Run Supply Curve of a Perfectly Competitive Market (LRS)
- Constant Cost Industry - Firms in the industry can buy as much inputs as needed without causing the input prices to go up
- Increasing Cost Industry - Increasing purchases of inputs causes input prices to go up


## Monopoly

- Single seller of a good with no close substitutes
- Sources of Monopoly Power
- Economies of Scale (Natural Monopoly)
- Economies of Scope (Cost Complementarities)
- Barriers to Entry
- While the perfectly competitive firm is a "price taker", the monopolist is a "price maker"


## Monopoly Cont'd

- Demand Curve of a Monopolist: downward-sloping demand curve
- $M R<P$
- $M R=P+Q \frac{d P}{d Q}$


## Monopoly Cont'd

- Profit Maximization by a Monopolist
- Look for where $M R=M C$ to determine the quantity supplied $Q^{*}$
- To find the price $P^{*}$ that the monopolist charges, use the point on the demand curve where the quantity is equal to $Q^{*}$
- Profit-maximization under monopoly: $M R=M C<P$
- Rule of Thumb for Monopoly: $M R=M C \Rightarrow Q^{*}$


## Monopoly Cont'd

- Monopoly Power - The ability to charge a price higher than MC (control of price)
- $M R=P+P \frac{1}{E^{D}}$
- $P=\frac{M C}{1-\frac{1}{\left|E^{D}\right|}}$


## Monopoly Cont'd

- A monopolist will never choose to operate where the demand curve is inelastic
- $M R=P+P \frac{1}{E^{D}}$
- In a perfectly competitive market, the firm faces a flat demand curve
- Markup Pricing: $\frac{1}{1-\frac{1}{\left|E^{D \mid}\right|}}>1$


## Price Discrimination

- Selling different units of output at different prices
- First-Degree Price Discrimination (also called Perfect Price Discrimination): $C S=0$ and $T S=P S$
- Second-Degree Price Discrimination (also called Nonlinear Pricing): Prices depend on the units of the good bought
- Third-Degree Price Discrimination - The monopolist sells output to different people for different prices
- Exception: the monopolist will sell output to only one of the markets


## Monopolistic Competition

- Imperfect competition
- Differentiated products, highly substitutable but not perfect substitutes
- Free entry and exit
- $M R=M C<P$
- No economic profit in the long-run


## Monopolistic Competition Cont'd

- Differentiated products by different firms: Firms are able to exert some control over the price they charge for their particular product
- The market is not a perfectly competitive one
- These firms are not monopolists


## Monopolistic Competition Cont'd

- Increasing returns to scale
- The AC for a firm falls as more output is produced
- Firms tend to specialize in the product lines that are most successful
- By selling more of those products, the AC for the production falls


## Monopolistic Competition Cont'd

- In the Short-Run

- In the Long-Run




## Question 1

Given a firm's short term production function is

$$
f(K, L)=10 K^{0.25} L^{0.25} F^{0.5}
$$

If we know that $F$ (which is some kind of fixed input) is 16 , find the short term supply function of the firm supposing the price is $p$, the rent is $r_{1}$ and the wage is $r_{2}$.

## Question 2

Touchie MacFeelie's production function is $.1 J^{1 / 2} L^{3 / 4}$, where $J$ is the number of old jokes used and $L$ is the number of hours of cartoonists' labor. Touchie is stuck with 900 old jokes for which he paid 6 dollars each. If the wage rate for cartoonists is 5 dollars per hour, then the total cost of producing 24 comics books is

## Question 3

Recall that Touchie McFeelie's production function for comic books is . $1 J^{1 / 2} L^{3 / 4}$. Suppose that Touchie can vary both jokes and cartoonists' labor. If old jokes cost $\$ 2$ each and cartoonists' labor costs $\$ 18$ per hour, then the cheapest way to produce comics books requires using jokes and labor in the ratio $\mathrm{J} / \mathrm{L}=$

## Question 4

Suppose that Dent Carr's long-run total cost of repairing s cars per week is $c(s)=3 s^{2}+192$. If the price he receives for repairing a car is 36 , then in the long run, how many cars will he fix per week if he maximizes profits?

## Question 5

Suppose that Irma's production function is $f(x 1, x 2)=\left(\min \left\{x_{1}, 2 x_{2}\right\}\right)^{1 / 2}$. If the price of factor 1 is $w_{1}=6$ and the price of factor 2 is $w_{2}=4$, then her supply function is?

## Question 6

A firm has the long-run cost function $C(q)=2 q^{2}+8$. In the long run, it will supply a positive amount of output, so long as the price is greater than

## Question 7

Suppose that the cost of capturing a cockatoo and transporting him to the U.S. is about $\$ 40$ per bird. Cockatoos are drugged and smuggled in suitcases to the U.S. Half of the smuggled cockatoos die in transit. Each smuggled cockatoo has a $10 \%$ probability of being discovered, in which case the smuggler is fined. If the fine imposed for each smuggled cockatoo is increased to $\$ 900$, then the equilibrium price of cockatoos in the U.S. will be

## Question 8

In the absence of government interference, there is a constant marginal cost of $\$ 5$ per ounce for growing marijuana and delivering it to buyers. If the probability that any shipment of marijuana is seized is .20 and the fine if a shipper is caught is $\$ 20$ per ounce, then the equilibrium price of marijuana per ounce is?

## Question 9

If the demand for pigeon pies is $p(y)=70-y / 2$, then what level of output will maximize Peter's profits?

## Thanks!

