



- Name: _____
 - Date: _____
 - Section: _____
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ECON 300: Intermediate Price Theory

Final Exam

Fall 2023

INSTRUCTIONS:

- Print your name and section number at the top of this page.
- Make sure that the exam is 13 pages long, including this one.
- You have up to 180 minutes to complete this exam.
- Please read all questions carefully before you begin answering.
- Answer all questions in the spaces provided on the question sheet.
- Good luck, and have a great Winter Break!

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Problem 1. Definitions**(3 Points Each)**

Select five items from the list below and provide a definition for each of the chosen items.

- | | | |
|--------------------|-----------------------|--------------------|
| • Economy of Scale | • Normal Goods | • Slutsky Equation |
| • Marginal Cost | • Indifference Curves | • Nash Equilibrium |
| • Deadweight Loss | • Market Power | • Marginal Utility |

1.A. Item #1: _____

1.B. Item #2: _____

1.C. Item #3: _____

Problem 1. Definitions (Continued)**(3 Points Each)**

Select five items from the list below and provide a definition for each of the chosen items.

- | | | |
|--------------------|-----------------------|--------------------|
| • Economy of Scale | • Normal Goods | • Slutsky Equation |
| • Marginal Cost | • Indifference Curves | • Nash Equilibrium |
| • Deadweight Loss | • Market Power | • Marginal Utility |

1.D. Item #4: _____

1.E. Item #5: _____

Problem 2. True / False**(3 Points Each)**

Determine whether the following statements are either TRUE or FALSE. If a statement is TRUE, no justification is needed. However, if a statement is FALSE, you MUST justify your verdict by providing an explanation.

2.A. When two inputs of production, L and K , are perfect substitutes, we should use the linear production function to model the firm's production.

2.B. A consumer's indifference curve is a set of bundles that provide the consumer with the same level of utility.

2.C. While government-imposed taxation causes deadweight loss, government-granted subsidies do not result in deadweight loss.

Problem 2. True / False (Continued)**(3 Points Each)**

Determine whether the following statements are either TRUE or FALSE. If a statement is TRUE, no justification is needed. However, if a statement is FALSE, you **MUST** justify your verdict by providing an explanation.

2.D. A firm's short-run cost of producing \bar{Q} units of output will not be lower than its long-run cost of producing \bar{Q} units of output.

2.E. When a firm's production triples in response to inputs being doubled, we can conclude that the firm's production technology exhibits technical progress.

2.F. In general, the marginal utility of consuming some good x will increase as the consumer increases their consumption of good x .

Problem 3. Multiple Choice / Short Answers**(3 Points Each)**

3.A. Which of the following statements is true?

- a. The slope of the budget constraint tells us “how many units of good y the consumer is willing to give up for one extra unit of good x .”
- b. The slope of the indifference curve tells us “how many units of good y the consumer has to give up for one extra unit of good x .”
- c. Indifference curves that are further away from the origin represent a higher level of utility.
- d. The budget line will “pivot” when the consumer’s income changes.

3.B. Which of the following statements is true?

- a. If $u(A) = 10$ and $u(B) = 100$, the consumer prefers B 10 times more than A .
- b. Preference relations that obey completeness and transitivity are said to be rational.
- c. $A \succ B$ means that bundle B is strictly preferred over bundle A .
- d. Lexicographic preferences obey the axiom of continuity.

3.C. Which of the following statements is true?

- a. If the prevailing market price of some good is \$10, a price floor of \$15 is binding.
- b. Monopolistic competition is always less beneficial for the consumers compared to perfect competition.
- c. The market price set under duopolies will be higher than market prices under a monopoly.
- d. The individual market demand that a firm producing in a perfectly competitive output market faces is downward sloping.

3.D. Which of the following is the correct definition of the marginal rate of substitution?

a. $\frac{MU_x}{P_x}$

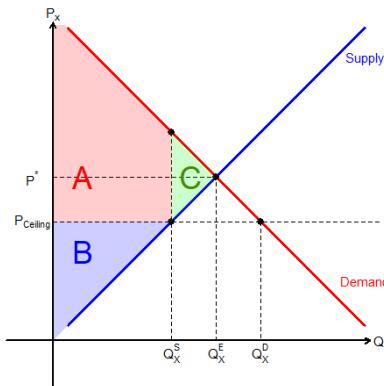
b. $\frac{MU_x}{MU_y}$

c. $\frac{MU_y}{P_y}$

d. $\frac{P_x}{P_y}$

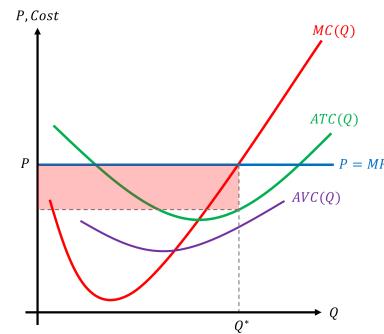
Problem 3. Multiple Choice / Short Answers (Continued) (3 Points Each)

3.E. Which of the following regions represent consumer surplus under a binding price ceiling?



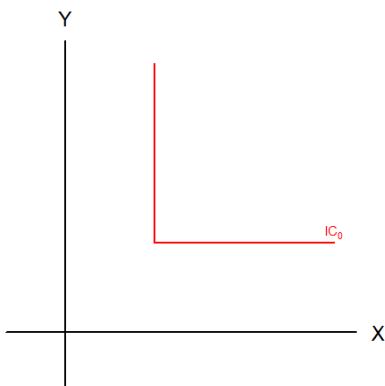
- a. Region A
- b. Region B
- c. Region C
- d. Region A + B
- e. Region A + B + C

3.F. Which of the following correctly identifies the red shaded region?



- a. Total Revenue
- b. Total Cost
- c. Profit
- d. Marginal Cost
- e. Average Total Cost

3.G. If you found out that a consumer's indifference curve can be represented as the diagram below, what type of utility function would you believe the consumer to have?



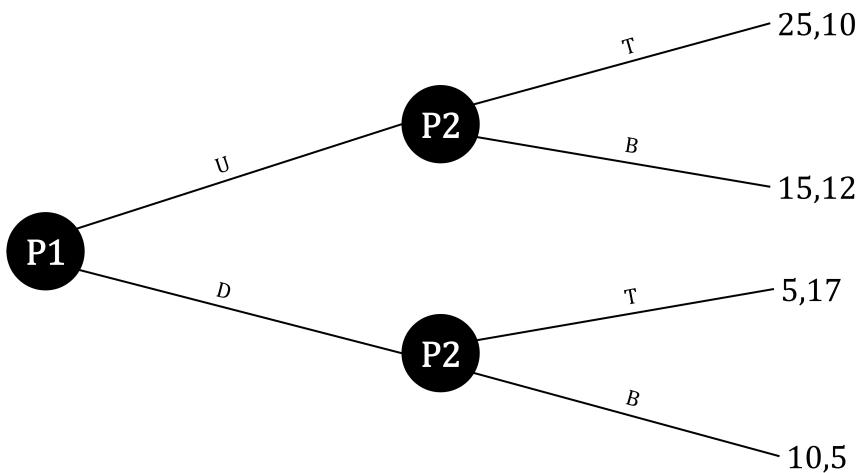
- a. A Linear Utility Function
- b. A Leontief Utility Function
- c. A Cobb-Douglas Utility Function

Problem 3. Multiple Choice / Short Answers (Continued)**(3 Points Each)**

3.H. Fill out the following table with the correct values.

Q	$TC(Q)$	$MC(Q)$	$ATC(Q)$
0	2,000	N/A	N/A
1	3,800		
2	4,800		
3	5,400		
4	5,800		
5	6,000		

3.I. The following is an extensive form representation of a dynamic game of complete information.
Find all Nash equilibria for this game.



Problem 4. Consumer Theory**(3 Points Each)**

Suppose that a consumer is participating in a market where goods x and y are traded. This consumer's utility function is given as:

$$u(x, y) = 5xy^3$$

4.A. Find the consumer's marginal utility for good x and y .

- $MU_x =$

- $MU_y =$

4.B. Suppose that $MU_x = y$ and $MU_y = 3x$. Find the expression for the consumer's marginal rate of substitution.

- $MRS_{xy} =$

4.C. Using the MRS_{xy} from 4.B, and assuming that the price of good x is P_x , price of good y is P_y , and that the consumer's income is M , find the consumer's optimal ratio of goods x and y .

4.D. Express the consumer's budget constraint as a mathematical equation.

Problem 4. Consumer Theory (Continued)**(3 Points Each)**

4.E. Using your answers from 4.C and 4.D, find the consumer's demand function for good x .

4.F. What is the optimal amount of good x for this consumer if $P_x = 5$, $P_y = 10$, and $M = 120$?

4.G. What is the optimal amount of good x for this consumer if $P_x = 10$, $P_y = 10$, and $M = 120$?

4.H. Is good x an ordinary good or a Giffen good? WHY?

Problem 5. Market Structure**(2 Points Each)**

Suppose that a profit maximizing firm producing good x is given the following information:

- Inverse Demand: $P_x = 240 - x$
- Total Cost Function: $TC(x) = 300 + x^2$

*For questions 5.A ~ 5.E, assume that this firm is the **ONLY FIRM** producing good x .*

5.A. Find the firm's total revenue function.

- $TR(x) =$

5.B. Based on your answers from 5.A, find the firm's marginal revenue function.

- $MR(x) =$

5.C. Find this firm's marginal cost function.

- $MC(x) =$

5.D. Assume that for this question only that $MR(x) = 180 - x$ and $MC(x) = 2x$. Find the firm's optimal production quantity.

5.E. If the firm was producing the quantity found in 5.D, what would be the corresponding P_x ?

Problem 5. Market Structure (Continued)**(2 Points Each)**

Suppose that a profit maximizing firm producing good x is given the following information:

- Inverse Demand: $P_x = 240 - x$
- Total Cost Function: $TC(x) = 300 + x^2$

For questions 5.F and 5.G, assume the market for good x is **PERFECTLY COMPETITIVE**.

5.F. How would you find this firm's supply function?

5.G. Assume that for this question that the market demand is $P_x = 240 - x$ and the supply is given as $P_x = 2x$. Find the firm's optimal production quantity and price.

5.H. Compare the optimal quantity /price you found in 5.D and 5.E to the new value you found in 5.G. Describe the difference, and explain why this difference exists.

• Original Score: _____

• Recovered Score: _____

• Original Date: _____

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