

EXAM 1

Intermediate Microeconomics EC 308-004
October 14, 2007

Name: _____

by writing my name i swear by the honor code

Read all of the following information before starting the Exam:

- This is an individual exam.
- Show all work, clearly and in order, if you want to get full credit. I reserve the right to take off points if I cannot see how you arrived at your answer (even if your final answer is correct).
- Justify your answers algebraically whenever possible to ensure full credit. When you do use your calculator, sketch all relevant graphs and explain all relevant mathematics.
- Circle or otherwise indicate your final answers.
- Please keep your written answers brief; be clear and to the point. I will take points off for rambling and for incorrect or irrelevant statements.
- This assignment has 5 problems and is worth 100 points. It is your responsibility to make sure that you have all of the answers!
- Good luck!

1. (*20 points*) PROBLEM 1: This question has 3 parts:

a. (*5 pts*) PART A: For each city across the U.S., economists construct a price index for a similar basket of goods. In Tuscaloosa the index is 120.4 and in Birmingham the index is 89.8. If you have been offered \$105,000 for a job in Tuscaloosa and \$98,000 for a similar job in Birmingham, which job affords you the highest purchasing power of the bundle of goods in the price index? Use the Tuscaloosa value as the base year.

b. (*5 pts*) Part B: Define the Bandwagon and Snob effects, respectively.

c. (10 pts) PART C: The demand for Romanian sausages is estimated from this theoretical model:

$$Q = kP^a I^b A^c e \quad (1)$$

where Q = units per day, P = price per unit, A = advertising budget per month by sellers, I = per capita income of consumers, and e = random error. In a recent study, one researcher estimated the log-linear form of this equation with regression analysis as:

$$Q = 2.5 - 0.33\log P + 0.15\log I + 0.2\log A \quad (2)$$

Explain what the coefficients of $\log P$, $\log I$, and $\log A$ reveal about this product.

2. (*20 points*) PROBLEM 2: In a city with a medium sized population, the equilibrium price for a city bus ticket is \$2.00 and the number of riders each day is 100,000. The short-run price elasticity of demand is -0.50, and the short-run elasticity of supply is 1.2.

a. (*10 pts*) PART A: Estimate the short-run linear supply and demand curves for bus tickets.

b. (5 pts) PART B: If the demand for bus tickets increased by 10% because of a rise in the world price of oil, what would be the new equilibrium price of bus tickets?

c. (5 pts) PART C: If the city council refused to let the bus company raise the price of bus tickets after the demand for tickets increases (see (B) above), what daily shortage of tickets would be created?

3. (20 points)

PROBLEM 3: Suppose you are in charge of a toll bridge that costs essentially nothing to operate. The demand for bridge crossings Q is given by

$$P = 15 - \frac{1}{2}Q. \quad (3)$$

a. (5 pts) PART A: Draw the demand curve for bridge crossings. (Note: Clearly mark the intersection points with the horizontal and vertical axes, respectively).

b. (5 pts) PART B: How many people would cross the bridge if there were no toll?

c. (5 pts) PART C: What is the loss of consumer surplus (CS) associated with a bridge toll of \$5?

d. (5 pts) PART D: The toll bridge operator is considering an increase in the toll to \$7. At this new higher price, how many people would cross the bridge? Would the toll bridge revenue increase or decrease? What does your answer tell you about the elasticity of demand?

4. (20 points) PROBLEM 4: Bruno has the following utility function:

$$U(X, Y) = 40X + 80Y - \ln X - 2\ln Y \quad (4)$$

where X is his consumption of CDs with a price of \$1 and Y is his consumption of movie videos, with a rental price of \$2. He plans to spend \$51 on both forms of entertainment.

a. (10 pts) PART A: Find Bruno's marginal utility with respect to X and with respect to Y .

b. (10 pts) PART B: Determine the number of CDs and video rentals that will maximize Maurice's utility. What is his utility at these levels? (Hint: Use the Lagrangian method)

5. (20 points) PROBLEM 4: Suppose two investments have the same two payoffs, but the probability associated with each payoff differs, as illustrated in the table below:

Payoff	Probability (Investment A)	Probability(Investment B)
\$150	0.20	0.30
\$200	0.60	0.40
\$250	0.20	0.30

a. (10 pts) PART A: Find the expected return and standard deviation of each investment.

b. (10 pts) PART B: Jill has the utility function $U = \ln I$, where I denotes the payoff. Which investment will she choose? (Note: Also show your response numerically).

Scrap Page

(please do not remove this page from the test packet)