

ECO 300 – MICROECONOMIC THEORY
Fall Term 2005
FINAL EXAMINATION

READ THESE IMPORTANT INSTRUCTIONS FIRST

[1] This is a closed-book examination. No books, handouts, notes, computers, cellular phones, ... Put away all of these NOW. Just you, your pencil (or preferably, pen), and your calculator for numerical computations.

[2] The exam has FIVE pages. Make sure you have them all. Question 1 is multiple choice, and you have to write your answers on the exam itself and return it. The other six questions should be answered using the answer books supplied.

[3] PRINT your name clearly at the bottom of this page, and PRINT your name at the top of each subsequent page of the exam for Question 1, and on the cover of each answer book you use. This is very important; if your name on the exam or any answer book is unclear, you will lose the grade for that part.

[4] Do not start writing answers until you are told you can. From that point, you have 180 minutes. Therefore you should plan to spend about 10 minutes reading the exam carefully and planning your answers, and then roughly 20 minutes answering Question 1, and averaging 25 minutes for each of Questions 2-7 (but your actual times may vary widely depending on the objective and subjective difficulties of individual questions). At the end of the 3 hours, time will be called. After that, extra time can be “purchased” at the rate of FOUR points per MINUTE or fraction thereof.

[5] Write clearly, succinctly, and legibly. We prefer you to use a ball-point pen or ink. Writing in pencil may get smudged or unclear; any such unclear answers will be interpreted as wrong. If you change your mind about an answer, make your erasures and corrections VERY CLEARLY and NOT IN PENCIL; any ambiguity will be interpreted as an incorrect answer. You must show the steps of your mathematical arguments and calculations to get credit for them; your prose arguments should be well structured and clearly written.

[6] Sign the honor pledge:
“I pledge my honor that I have not violated the honor code during this examination.”

Your signature

YOUR NAME (PRINTED):

YOUR NAME:

QUESTION 1: (10 points, 1 each) Multiple choice. Note that two or more answers may be partially correct. Choose the one that fits best. Mark your choice clearly and unambiguously on the exam itself. Return the exam with your other answerbooks.

1. Jon's income-consumption curve is a straight line from the origin with a positive slope. Now Jon's preferences change such that his income-consumption curve remains a straight line from the origin, but rotates 15 degrees clockwise. As a result, Jon's demand curve for the good on the horizontal axis
 - a. will shift left.
 - b. will shift right.
 - c. will not change.
 - d. might do any of the above
2. Consider two gambles: I. 10% chance of winning \$100 and 90% of “winning” 0
II. 50% chance of winning \$4 and 50% of winning \$1. Any risk-averse individual would always
 - a. prefer gamble I to a sure \$10..
 - b. prefer gamble II to a sure \$2.
 - c. prefer a sure \$10 to gamble I.
 - d. prefer a sure \$2 to gamble II.
 - e. both (c) and (d) above.
3. Consider the following two statements: I. Isoquants cannot cross one another.
II. An isoquant that is twice the distance from the origin must represent twice the level of output.
 - a. Both I and II are true.
 - b. I is true, and II is false.
 - c. I is false, and II is true.
 - d. Both I and II are false.
4. The textbook for your class was not produced in a perfectly competitive industry because
 - a. there are so few firms in the industry that market shares are not small, and firms' decisions have an impact on market price.
 - b. upper-division microeconomics texts are not all alike.
 - c. it is not costless to enter or exit the textbook industry.
 - d. of all of the above reasons.
5. In the exchange Edgworth box,
 - a. The contract curve is a subset of the core
 - b. The competitive equilibrium is in the core and therefore on the contract curve.
 - c. The competitive equilibrium is on the contract curve but not in the core
 - d. The competitive equilibrium is off the contract curve

YOUR NAME:

6. The deadweight loss due to monopoly power is
- a. equal to the value of monopoly profits.
 - b. equal to the transfer of surplus from consumers to the monopolist when the monopolists raises price above marginal cost.
 - c. created by the monopolist's restriction of output below the competitive level.
 - d. affected in the short run by changes in lump-sum taxes.
 - e. both c. and d.
7. The burden of a tax per unit of output will fall heavily on consumers when demand is relatively _____ and supply is relatively _____.
- a. elastic; elastic
 - b. inelastic; inelastic
 - c. elastic; inelastic
 - d. inelastic; elastic

8. Read the following game matrix carefully. In each cell, the first number is the Row player's payoff, and the second number is the Column player's payoff.

		Column	
		Left	Right
Row	Up	1 , - 1	0 , 0
	Down	0 , 0	- 2 , 2

In the Nash equilibrium of this game, Row chooses

- a. Up
 - b. Up with probability $\frac{2}{3}$, Down with probability $\frac{1}{3}$
 - c. Up with probability $\frac{1}{2}$, Down with probability $\frac{1}{2}$
 - d. Up with probability $\frac{1}{3}$, Down with probability $\frac{2}{3}$
 - e. Down
9. Which of the following is TRUE about a college education as a signaling device?
- a. It is a useful signal only if individuals choose majors related to their ultimate field of employment.
 - b. It is a useful signal only if a college education is open to all individuals, no matter what their previous level of educational accomplishment was.
 - c. It can be a useful signal whether or not people actually learn anything in college.
 - d. It is a useful signal only if the job in question cannot be done without the preparatory coursework the college degree required.
 - e. It is less and less a useful signal in the post-industrial economy, where the skill sets employers need change so rapidly.

YOUR NAME:

10. Which of the following is a negative externality connected to attending college?
- a. The fact that completion of a college degree acts as a signaling mechanism to employers.
 - b. The fact that other costs, such as books and materials, are incurred in addition to tuition and fees.
 - c. The fact that your college has required that all individuals living in student housing either get or show they have already obtained vaccinations against all communicable diseases.
 - d. The fact that the people in the next room play loud music at hours when you want to sleep.
 - e. The fact that you will get benefits from college that you don't currently anticipate.

QUESTION 2: (15 points)

You have \$20 per week to spend, and two possible uses for this money: telephoning friends back home, and drinking coffee. Each hour of phoning costs \$2, and each cup of coffee costs \$1. Your utility function is $U(X,Y) = XY$, where X is the hours of phoning you do, and Y the number of cups of coffee you drink. (X and Y are continuous variables. Interpret fractions as averages over several weeks.)

(a) What are your optimal choices? What is the resulting utility level? You can use the standard result on the constrained maximization of such a function, but must state it clearly.

(b) Now suppose the price of telephone calls drops to \$1 per hour. What are your optimal choices? What is the resulting utility level?

(c) How much income per week will enable you to achieve the same quantities at the new prices as the ones you chose before? What income will enable you to attain the same utility as you did before? Which amount is smaller, and why?

QUESTION 3: (15 points)

In the short run, a price-taking firm has a fixed and sunk cost 5, a fixed but avoidable cost 4, and a variable (therefore also avoidable) cost function Q^2 , where Q denotes the quantity of output, and is a continuous variable. In the long run, the fixed and sunk cost will become fixed but avoidable. Find the equations for its supply curves in the short run and in the long run.

What will be the long run industry supply curve if all actual and potential firms in the industry have the same cost structure and there is free entry and exit?

QUESTION 4: (15 points)

In 1975, the demand and supply curves for natural gas in the U.S. were given by the respective equations

$$Q^D = 30 - 5P, \quad Q^S = 16 + 2P,$$

where the quantity demanded (Q^D) and the quantity supplied (Q^S) were measured in trillions of cubic feet, and the price P in dollars per thousand cubic feet.

- (a) Draw a rough figure of the demand and supply curves.
- (b) What is the market equilibrium price and what quantity is supplied and consumed at this price?
- (c) Suppose the government imposes a price ceiling at \$1 per thousand cubic feet. How much gas is produced at this price? Suppose this quantity is allocated in such a way that those consumers with the highest willingness to pay get to buy the gas, but they pay only the ceiling price. What price is the marginal buyer willing to pay?
- (d) Contrast the price ceiling situation of (c) and the market equilibrium in (b). Because of the price ceiling policy: What is the gain in consumer surplus? What is the loss of producer surplus? What is the deadweight loss? You should mark these surpluses etc. as areas on the supply-demand figure and also calculate the numbers.

QUESTION 5: (15 points)

B.B. Lean and Rainbow's End are mail-order clothing sellers. The catalogs of both feature very similar sweaters. Consumers look for low prices but have some innate preference for one firm or the other; therefore the sweaters sold by the two firms are close but not perfect substitutes. Specifically, econometricians have estimated that the demand functions for the two firms' sweaters are as follows

$$Q_1 = 780 - 18 P_1 + 16 P_2, \quad Q_2 = 780 + 16 P_1 - 18 P_2$$

where the subscript 1 denotes B.B. Lean and subscript 2 denotes Rainbow's End. All prices and quantities are to be regarded as continuous variables.

B.B. Lean obtains its sweaters from Thailand at \$40 each; Rainbow's End has located a cheaper supplier in Bangladesh, and can obtain its sweaters at \$20 each.

Each firm sets its price without knowing what price the other is choosing; so they are playing a Bertrand duopoly game.

- (a) Find expressions for the profits of each firm in terms of the prices of both.
- (b) Find expressions for their best response (reaction) functions.
- (c) Calculate the equilibrium prices of the two firms
- (d) Calculate the resulting quantities sold by the two firms.
- (e) Calculate the resulting profits of the two firms.

QUESTION 6: (15 points)

What is meant by moral hazard in insurance? What is the economic efficiency cost of moral hazard? What steps do insurance companies take to mitigate moral hazard?

QUESTION 7: (15 points)

"If property rights are well specified, and parties can bargain without cost and to their mutual advantage, the resulting outcome will provide an efficient resolution of any externalities, no matter to which party the property rights are initially assigned." Explain this statement using an example.