ECO 300 – MICROECONOMIC THEORY
Fall Term 2005
MIDTERM EXAMINATION

INSTRUCTIONS

[1] This is a closed-book examination. Put away your books, handouts, notes, computers, calculators, cellular phones, … now.

[2] The exam has FOUR pages. Make sure you have them all.

[3] PRINT your name clearly, and write your precept day and time, on the first page of EACH answer book you use.

[4] Do not start writing answers until you are told you can. From that point, you have 80 minutes. Therefore you should plan to spend roughly 20 minutes on each question. At the end of the 80 minutes, 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.

[6] Write out and sign the honor pledge using its precise wording "I pledge my honor that I have not violated the honor code during this examination" on the front page of the first answer book you use.

QUESTION 1: (25 points; 3 each, plus 1 bonus if you get all 8 correct)

MULTIPLE CHOICE. Merely write the question number followed by the letter for the best answers, in the order of the question.

1.   The price of good A goes up. As a result the demand for good B shifts to the left. From this we can infer that:
a.   good A is used to produce good B.
b.   good B is used to produce good A.
c.   goods A and B are substitutes.
d.   goods A and B are complements.
e.   none of the above.

2.   The price of gasoline goes up by 8% (other prices and incomes held constant), and its quantity demanded goes down by 2%. The own price elasticity of demand for gasoline in numerical value is
a.   4
b.   1
c.   ¼
d.   0
e.   None of the above

3.   Which of the following is true about the indifference curve where one commodity (such as pollution) is "bad" and the other is the usual kind of "good"?
a.   It has a negative slope.
b.   It has a positive slope.
c.   It is horizontal.
d.   It is vertical.
e.   It is L-shaped

4.   If both prices and income in a two-good society double, what will happen to the budget line?
a.   The intercept of the budget line on the vertical axis will increase.
b.   The intercept of the budget line on the horizontal axis will decrease.
c.   The slope of the budget line may either increase or decrease.
d   There will be no effect on the budget line.
e.   Insufficient information is given to determine what effect the change will have on the budget line but we know society is worse-off.

5.   Good A is an inferior good. If the price of good A were to suddenly double, the substitution effect would cause the purchases of good A to increase by
a.   more than double.
b.   exactly double.
c.   less than double.
d.   any of the above are possible.
e.   none of the above.

6.   Upon graduation, you are offered three jobs.

Company	Salary	Bonus	Probability of Receiving Bonus
Samsa Exterminators	100,000	20,000	.90
Gradgrind Tech	100,000	30,000	.70
Goblin Fruits	115,000	--------	-------

          Which of the following is true?
a.   If you're risk-neutral, you go work for Goblin Fruits.
b.   If you're risk-loving, you go work for Goblin Fruits.
c.   If you're risk-neutral, you go work for Samsa Exterminators.
d.   If you're risk-neutral, you go work for Gradgrind Tech.

7.   A farmer uses M units of machinery and L hours of labor to produce C tons of corn, with the following production function $C = L^{0.5} M^{0.75}$. This production function exhibits
a.   decreasing returns to scale for all output levels
b.   constant returns to scale for all output levels
c.   increasing returns to scale for all output levels
d.   no clear pattern of returns to scale

8.   Which of the following is NOT a condition for the combination of inputs to be cost-minimizing?
a. $MRTS = MP_L / MP_K$.
b. $MP_L/w = MP_K/r$.
c. $MRTS = w/r$.
d. $MP_L/MP_K = w/r$.
e.   None of these.

QUESTION 2: (25 points)

        Latte can be produced for $2 each cup. The supply is perfectly elastic at this price. The demand curve is given by $Q = 500 - 125 P$, where the quantity is measured in millions. Draw a rough sketch of the supply and demand curves and calculate numerically the equilibrium price and quantity.

        Now suppose the Association of Baristas convinces the government to offer a subsidy of 80 cents per cup of latte (they offer the argument that this will ensure that the citizens are more awake and can better watch out for any security risks), so the price to consumers falls to $1.20. Show in your figure, and calculate the numerical values of,
        (1) the quantity sold,
        (2) the government's budgetary cost of providing the subsidy,
        (3) the increase in consumer surplus,
        (4) the dead-weight loss caused by the subsidy.

QUESTION 3: (25 points)

        (a) What is meant by "expected utility" in the theory of consumer behavior under risk?
        (b) What kind of utility functions do risk-averse expected-utility-maximizers have? Give an example for such a utility function, either algebraically or by drawing a figure.
        (c) Give an algebraic expression for, or show in a figure, the risk-premium in your example.
        (d) Give an example of another utility function that represents the same preferences you gave in (b)
        (e) EITHER Outline one criticism of expected utility theory, OR outline one alternative that has been proposed to that theory.

QUESTION 4: (25 points)

You have two final exams coming up: Marxism, and Fantasy-Fiction. (Can you tell them apart?) You believe that if you read K pages of Das Kapital, and L pages of The Lord of the Rings, your GPA will be $A\,K^{0.1}\,L^{0.4}$, where A is a positive parameter (algebraic constant). It takes you r minutes to read each page of Das Kapital, and w minutes to read each page of The Lord of the Rings. You have a target G of the GPA you want to achieve (to get that coveted law-school admission), but don't want to spend a minute more reading than you have to. Both books are very long, and you are not going to be able to read either of them fully. So you want to choose K and L to minimize the total number of minutes M it takes you to achieve your target G.

Cite and use a standard formula for your optimum choice of K and L. Hence find a formula giving the total number of minutes M you have to spend reading, as a function of your GPA target G, and of A, w, r.

Prove that the marginal time-cost of your GPA is twice the average time-cost.

NOTE: In your calculations you will come across messy expressions like $0.2^{0.2}$ and $0.8^{0.8}$. You DO NOT need to evaluate them numerically; just carry them like that in your formulas.