

Spring 2007

MICROECONOMIC THEORY COMPREHENSIVE EXAMINATION

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Write legibly in blue or black ink, not pencil. Begin each question on a new page. Number the questions you are answering at the top of the sheet.

SECTION A (Select 8 of 9. True or false or “it depends”, taking the time to explain why in detail)

1. The great majority of people derive nearly all their income from supplying labor and only a little from supplying capital. Therefore we would expect the ordinary elasticity of labor supply to be more elastic than the supply of capital.

2. If people are risk averse they would respond more to an increase in the return on an investment that raised the average return by 10% if it were due to a 10% increase in all risky outcomes than if it were due to a raise in the most favorable outcome.

3. High gasoline prices in recent past definitely implicate that crude oil become scarcer.

4. If duopolists behave like Bertrand supposed then there can be no equilibrium price above a common marginal cost even if the goods produced are not perfect substitutes.

5. An individual whose preferences have the expected utility property might prefer a gamble $(p \circ a_1, 1 - p \circ a_2)$ (where $0 < p < 1$) to the sure outcome a_1 even if it's the case that he prefers a_1 to a_2 .

6. A competitive firm with constant returns to scale can not possibly have a maximized profit which is positive and finite.

7. The entire contract curve represents all possible bargaining outcomes in an exchange economy.

8. The Walras' Law is universally true because it is a “law”.

9. If other factors are in more inelastic supply the demand for a given factor will be more elastic.

SECTION B (Answer 3 of 4. Short answers.)

10. Explain why if marginal cost is constant that a profit maximizing monopolist using a two part tariff (an entrance fee and a user fee) and confronting two different types of customers that it can not tell apart will not necessarily set the usage fee equal to marginal cost and may set it above marginal cost.

11. Let $x(\mathbf{p}, y)$ be a consumer's choice function given prices \mathbf{p} and income y . Show that if the *weak axiom of revealed preference* and budget balancedness are satisfied, then $x(\mathbf{p}, y)$ must be homogeneous of degree zero in (\mathbf{p}, y) .

12. There are n identical residents in a street. They have constant marginal "willingness to pay" for street lights. If the cost function of street light is given by $c(x) = ax^2$ (x is # of street lights). What is the Pareto efficient number of street light? What if n residents are not identical because they have different marginal "willingness to pay" for the street light?

13. Suppose the production function is given by $f(x_1, x_2, \dots, x_n) = \left[\sum_{i=1}^n a_i x_i^\rho \right]^{1/\rho}$, where

$$a_i \geq 0, \quad \sum_{i=1}^n a_i = 1, \quad \text{and } 0 \neq \rho < 1.$$

- a. Find the elasticity of substitution σ_{ij} .
- b. As $\rho \rightarrow 0$, σ_{ij} approaches what value?

SECTION C (Answer 2 of 3. Longer answers.)

14. There are two industries in an economy. The industries use labor and capital as factors and the total endowments of labor and capital is L^{\wedge} and K^{\wedge} respectively. The production functions are $y_1 = L_1^{1/3} K_1^{2/3}$ and $y_2 = L_2^{2/3} K_2^{1/3}$.

a. What is the ratio of "capital-labor ratio" between industry 1 and industry 2?

b. On the basis of factor intensities, which industry will increase output and which will decrease output when the endowment of labor increases? Why?

15. A risk-averse individual has an initial wealth w . He faces a probability p ($0 < p < 1$) of having an accident which will cause a loss of $L > 0$. Insurance can be purchased price β , i.e., if he desires a coverage of $\$x$, then the total cost of insurance is simply βx .

a. Show that if insurance is *actuarially unfair*, i.e., $\beta > p$, then the optimal choice of coverage x^* is less than L .

b. Show that if the individual's preferences display *decreasing absolute risk aversion*, then insurance is an "inferior" good.

16. a) define the short run cost function. How does it differ from the long run cost function (include definitions of each in your answer). Why is the short run cost function more useful in empirical analyses?

b) Show formally how you would derive both the long run elasticity of input substitution, the long run scale elasticity.