Economics 500: Microeconomic Theory

State University of New York at Binghamton
Department of Economics
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Final

The exam has eight questions and is worth 100 points. Each question is of equal value.

1. True or False (Explain briefly and use an example and/or state assumptions if necessary)?

    (a) If, for every possible price, the quantity demanded of a commodity at that price is greater in market A than in market B, then the price elasticity of demand for the commodity is necessarily more elastic in market A than in market B.
    (b) On a non-linear demand curve, constant price elasticity is impossible.

2. Answer both

    (a) J. Trueblue always spends one-third of his income on American flags. Show his income elasticity of demand for such flags. Also, show his price elasticity of demand for flags.
    (b) Use the fact that the demand functions are homogenous of degree zero in all prices and income (in other words, if we multiply all prices and income by the same constant, the optimal demand bundle will not change) to show that $e_{Qx,Px} + e_{Qx,Py} + e_{Qx,I} = 0$. Hint: Use Euler's theorem which states that if a function $f(Z_1, Z_2, \ldots, Z_n)$ is homogenous of degree m, then $f_1 * Z_1 + f_2 * Z_2 + \ldots + f_n * Z_n = m*f(Z_1, Z_2, \ldots, Z_n)$.

3. True or False (Explain briefly and use an example and/or state assumptions if necessary)?

    (a) If good X is a gross substitute for Y, then Y must be a gross substitute for X.
    (b) If good X is an inferior good, then good Y must be a normal good.

4. Answer both

    (a) Show that the marginal rate of technical substitution is equal to the marginal product of labor divided by the marginal product of capital.
    (b) Show that marginal revenue is a function of the price elasticity of demand.

5. Answer both

   (a) Suppose the demand function for a good is given by $q = 100/p$. What price will maximize revenue?
   (b) A monopolist faces a demand function $q = 10/p$, and has a constant marginal cost of 1. What is the profit maximizing level of output?

6. True or False (Explain briefly and use an example and/or state assumptions if necessary)?

   (a) A monopolist will never provide a Pareto efficient level of output on its own.
   (b) A price making, profit maximizing firm will choose any point on the demand curve if the marginal cost is zero.

7. True or False (Explain briefly and use an example and/or state assumptions if necessary)?

   (a) If we know the contract curve, then we know the outcome of any trading.
   (b) No individual can be made better off if we are at a Pareto efficient allocation.

8. Answer both

   (a) There are two agents with identical, strictly convex preferences and equal endowments. Describe the core of this economy and illustrate it in an Edgeworth box.
   (b) Suppose 10 people live on a street and that each of them is willing to pay \$2 for each extra streetlight, regardless of the number of streetlights provided. If the cost of providing x streetlights is given by $c(x) = x^2$, what is the Pareto efficient number of streetlights to provide?