V/C31.0010.002. Fall 1999

Intermediate Microeconomics Sample Midterm 1

Points 70. Time 70 minutes (1.20–2.30pm). The first question carries 30 points; the second 40 points. Questions with parts within them give equal weight to the parts.

Guide for Time Allocation: The questions in part (1) should take no more than 5 minutes each to answer. The questions in part (2) should take you no more than 10 minutes each. This schedule will allow you to finish the exam in 70 minutes. Good luck.

(1) (**30 points, 5 points per part**) Are the following statements true or false? A simple yes-no answer will *not* suffice. Explain, with the use of diagrams where necessary.

[a] When a good is inferior, the demand curve for it may still be downward sloping.

[b] A consumer's optimum is always characterized by the equality of the marginal rate of substitution and the price ratio.

[c] The utility function $u(a,b) = a^{0.3}b^{0.9}$ yields the same set of ordinal preferences as $u(a,b) = 12\log a + 36\log b$.

[d] The price elasticity of demand along a straight-line demand curve is constant, no matter where you measure it.

[e] An increase in the interest rate must stimulate savings.

[f] The assumption of transitivity ensures that indifference curves cannot have "thick segments": they must be lines.

(2) (**40 points, 10 points per part**) Answer the following questions briefly and clearly. You can put in a diagram, and/or a simple example to illustrate. *These are not true-false questions.*

(i) The demand curve for milk is given by $P = 20 - 2q$, where P is price and q is quantity. If the price of milk drops from \$5 to \$3 per unit, estimate the gain in consumer surplus.

(ii) Using the concept of equivalent variation, show that a lump sum tax on a consumer can raise more money than a tax on one of the goods he purchases, while keeping the consumer on the same post-tax indifference curve in both cases.

(iii) Sketch indifference curves that are consistent with each of the following sets of preferences. Provide enough numeric examples to show any relevant features.

a) Amanda: Extra Strength Tylenol and generic acetaminophen are perfect substitutes to each other, but she must take only one Extra Strength Tylenol for two generic acetaminophen tablets.

b) Bob: gets utility out of only two goods: spicy hot chili peppers and pizza. Chili peppers are good as long as less than five are consumed; any more makes him worse off. More pizza always makes him better off.

(iv) Assume that Mary is guaranteed \$100 of income per day as long as she is not working. As soon as she earns even one dollar of income, then this income subsidy is lost. Mary is unmarried and has no other sources of income. For any wage rate less than \$15 per hour, she chooses not to work at all. For wage rates greater than \$15 per hour, she chooses to work a constant 10 hours per day.

Draw a set of budget constraints and indifference curves between leisure and all other goods depicting this case. On the right hand diagram, sketch the corresponding supply curve of labor for Mary.