V/C31.0010.002. Fall 1999

Intermediate Microeconomics 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**] The utility function $u(a, b) = a^{-0.2}b^{0.8}$ violates the nonsatiation assumption.

[**b**] If a consumer is a net borrower, an increase in the interest rate *must* reduce his borrowing, if consumption in each date is a normal good.

[**c**] If a good has income elasticity less than one, it is inferior.

[**d**] If the demand curve for good A is everywhere flatter than that of good B, then good A has a higher price elasticity of demand.

[**e**] If a given set of consumer preferences are transitive, then there must be an infinite number of indifference curves describing those preferences.

[**f**] If there are two goods, A and B, and A is Giffen, then B must be a price-substitute for A.

(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) Potatoes sell for \$5 per pound. Sam buys 20 pounds of potatoes per month. Now there is a potato blight, and the price goes up to \$7. Sam's demand falls to 15 pounds. Without *any* assumptions on the demand curve (except that it is continuously downward sloping), show that Sam's loss in consumer surplus is at least 30 but no more than 40.

(ii) Tom consumes, among other things, telephone services. He pays a tax on every phone call he makes, and ends up paying \$100 every year in telephone taxes. Show that Tom would actually *prefer* to pay a flat tax of \$100 and make phone calls taxfree.

(iii) Sketch indifference curves that are consistent with each of the following sets of preferences.

a) Classical music and hard rock: Rita loves listening to hard rock as long as it's no more than 5 hours a day; thereafter she hates it. But she loves classical music, the more the better.

b) Beer and pizza: Mike drinks beer, but only gets satisfaction from the number of *whole* bottles he finishes (for example, $2\frac{1}{2}$ beers are the same as 2 as far as he's concerned). He also loves pizza (in continuous amounts; no surprises here).

(iv) Assume Sally has 100 hours a week which she devotes to leisure or to making money. The wage rate is \$10 per hour. Weekly income of \$200 or less is fully free of taxation, but *extra* income above this amount is taxed at 20%. This continues until (gross) weekly income reaches \$600, after which *extra* earnings above this amount are taxed at 10%.

(a) Draw the budget constraint. (b) If Sally has convex indifference curves, is she guaranteed to have a unique optiumum choice? Explain.