Micro II Final, April 28, 2011

You have 2 hours to complete this exam. Answer all five questions. You may use results covered in class, the textbook, or your homework to answer the questions. To insure maximum credit, be sure to explain your answers. Each question is worth 30 points, for a total of 150 points. The problems are not equally hard. Good luck!

1. Consider a two-person, two-good exchange economy. Consumer i has utility $u_i(x^i) = \max\{x_1^i, x_2^i\}$. The endowments are $\omega^1 = (3, 1)$ and $\omega^2 = (0, 2)$.

   a) Find all the equilibria of this economy.

   b) Find all Pareto optima.

2. Suppose there are two inputs and the cost function is $c(q, w) = q(w_1 + 3w_2)$.

   a) Find the conditional factor demands.

   b) Find the production function.

3. A firm with cost function $c(q) = q^2$ is uncertain about the price that it can receive for its product. The price is a random variable over $[0, 10]$ with probability density $\frac{3}{1000}p^2$.

   a) Suppose the firm is risk-neutral and calculate expected profit as a function of q.

   b) What q maximizes expected profit?

   c) Using the choice of q from part (b), what is the probability that profit will be negative?

4. Consider a production economy with 2 goods and 2 consumers. There is one firm with technology set $Y = \{(y_1, y_2) : y_1 \leq -2y_2, y_2 \leq 0\}$. Consumer one has utility $u_1(x^1) = x_1^1 + 2x_2^1$ and consumer two has utilty $u_2(x^2) = \sqrt{x_1^2 x_2^2}$. Endowments are $\omega^1 = (0, 2)$ and $\omega^2 = (0, 3)$. Find all equilibrium allocations.

5. Consider an exchange economy with 2 consumers, 2 goods, and 2 states of the world. Let $x_{s\ell}^i$ denote consumer i's consumption of good ℓ in state s. Each consumer has utility function

$$u(x^i) = \frac{1}{2}\left[(x_{11}^i x_{12}^i)^{1/3} + (x_{21}^i x_{22}^i)^{1/3}\right]$$

Consumer 1's endowment is $\omega^1 = ((2, 2), (0, 0))$. Consumer 2's endowment is $\omega^2 = ((0, 0), (2, 2))$. There is one asset with return vector $r = (1, .5)$.

   a) Is there a complete set of assets?

   b) Find a Radner equilibrium.

   c) Is the Radner equilibrium you found Pareto optimal?