GS/ECON 5010 Section "B" Assignment 4 F2011

due : Wednesday November 30 before class

Do all 5 questions. Each counts 20%.

1. What does the contract curve look like for a 2–person, 2–good exchange economy, with a total endowment of $E_1$ units of good 1 and $E_2$ units of good 2, if the preferences of the two people could be represented by the utility functions

$$u^1(x_1^1, x_2^1) = 100 - \frac{1}{x_1^1} - \frac{1}{x_2^1}$$

$$u^2(x_1^2, x_2^2) = 50 - \frac{1}{x_1^2} - \frac{4}{x_2^2}$$

where $x_j^i$ is person $i$'s consumption of good $j$? [The superscripts in the definition of $u^2$ are the person's name, "2", not "squared".]

2. What are the allocations in the core of the following 3–person, 2–good economy? Person $i$'s preferences can be represented by the utility function $u^i(x_1^i, x_2^i)$, where

$$u^1(x_1^1, x_2^1) = x_1^1 x_2^1$$

$$u^2(x_1^2, x_2^2) = x_1^2 x_2^2$$

$$u^3(x_1^3, x_2^3) = x_1^3 + x_2^3$$

and the endowment vectors of the three people are $\mathbf{e}^1 = (3, 0), \mathbf{e}^2 = (1, 4), \mathbf{e}^3 = (2, 2)$.

3. What is the competitive equilibrium allocation for an exchange economy with a continuum of people, where the preferences of a type–$v$ person can be represented by the utility function

$$u^v(x_1, x_2) = (x_1)^v (x_2)^{1-v}$$

where the taste type $v$ is distributed uniformly over the interval $[0, 1]$ (so that the fraction of people with a taste type of $v$ or less is just $v$), and where each person has the same endowment of goods,

$$\mathbf{e} = (1, e_2) \qquad ?$$

**over**

4. Give an example of a constant–sum ("zero–sum") game which has exactly one Nash equilibrium in pure strategies.

5. Find all the Nash equilibria (in pure and mixed strategies) in the following strategic–form two–person game.

| | $a$ | $b$ | $c$ |
|---|---|---|---|
| $A$ | $(4,0)$ | $(2,2)$ | $(2,4)$ |
| $B$ | $(6,4)$ | $(12,6)$ | $(1,8)$ |
| $C$ | $(5,3)$ | $(3,12)$ | $(0,6)$ |
| $D$ | $(8,6)$ | $(6,2)$ | $(1,2)$ |