GS/ECON 5010 section B Assignment 1 F2015

due : Wednesday October 7 before class (2.30 pm)

Do all 5 questions. Each counts 20%.

1. Are the preferences described below strictly monotonic? Convex? Explain briefly.

There are three different goods : potatoes, rice and noodles. (So a consumption bundle (x_1, x_2, x_3) is a bundle with x_1 kilograms of potatoes, x_2 kilograms of rice and x_3 kilograms of noodles.)

Each kilogram of potatoes has 1000 calories, each kilogram of rice has 800 calories and each kilogram of noodles also has 800 calories.

If bundle $\mathbf{x}$ has strictly more calories than bundle $\mathbf{y}$, then the person prefers $\mathbf{x}$ strictly to the bundle $\mathbf{y}$.

If the bundles $\mathbf{x}$ and $\mathbf{y}$ have the same number of calories, then the person prefers strictly whichever bundle contains strictly more rice.

If two bundles have the same number of calories, and the same quantity of rice, then the person is indifferent between them.

2. Are the preferences represented by the utility function below strictly monotonic? Convex? Explain briefly.

$$U(x_1, x_2) = \min\left(x_1, x_2 - \frac{1}{x_1}\right)$$

3. Calculate a person's Marshallian demand functions, if her preferences can be represented by the utility function

$$u(x_1, x_2, x_3) = \frac{x_1 x_2}{x_1 + x_2} + \log x_3$$

4. Calculate a person's Marshallian demand functions, if her preferences can be represented by the utility function

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

5. Find the expenditure function, Hicksian demand functions and indirect utility function for the preferences of question #4 above.