University of Ottawa **Paul Makdissi**
Department of Economics **Winter 2015**

ECO3153 Microeconomic Theory III
Homework #1

Due date: February 12, 2015.

Problem 1. Please indicate whether each statement is "true" or "false" and justify your answer.

a) $CV_{AB} = -EV_{BA}$.

b) In absence of money illusion, we can compute the income elasticity if all the price elasticities are known.

c) Given that there is a desutility associated with labor, some workers that are actually employed may have a level of utility that is lower than for a situation in which they are on social assistance.

d) If there is one inferior good, there is at least one luxury good.

Problem 2. Suppose that a consumer with income m has the Stone-Geary utility function:

$$U(x) = \prod_{i=1}^{n} (x_i - \gamma_\iota)^{\beta_i},$$

where $0 < \beta_i < 1$ and $\sum_{i=1}^{n} \beta_i = 1$. For all goods i, $\gamma_i > 0$ represents the minimum consumption of good i.

a) If p_i is the price of good i, write down the budget constraint of this consumer.

b) Find the Walrasian demands.

c) Verify that these demands are homogenous of degree 0 in (p, m).

d) Show that Cournot and Engel aggregations hold.

e) Find the Hicksian demands.

f) Show that the own-price substitution effects are negative.

g) Show that the cross-price substitution effects are symetric.

h) Which goods are inferior?

i) Wich one have an elastic demand?

j) Show that Roy's identity holds.

k) Show that the expenditure function is homogenous of degree 1 in p.

Problème 3. Peter lives on Island 1, which is part of an archipelago of four islands. There is 3 consumption goods on these Islands. Peter has an income of 12 and has the following utility function:

$$U(x) = x_1 x_2 x_3.$$

Assume that Peter is the only inhabitant of this archipelago who is able to travel by boat between these islands. In this framework, prices may be different from an island to the other. Assume that these prices are

$$\begin{aligned} p^1 &= (1,2,3) \\ p^2 &= (1,3,4) \\ p^3 &= (0.9,2,3) \\ p^4 &= (1.8,3,2) \end{aligned}$$

where p^i represents Island i's price vector. Assume that Peter travels between each islands. He starts from Island 1, then goes to Island 2, then Island 3 and finishes on Island 4. Give a complete description of what Peter buys on each Island.

Problem 4. Exercice 4.1, 4.3 and 4.9 (Cowell, pages 95-97).