Homework #1

Deadline: Monday, 10 September 2012, 13:00

Question 1 (10 marks)

A social welfare function F is *nonimposed* if for every preference relation R there exists a profile $(R_1, \ldots, R_n)$ such that $F(R_1, \ldots, R_n) = R$. That is, if F is nonimposed, then for every possible social preference order R there exists a profile of individual preferences under which R will be chosen: R is not excluded as the social preference order *a priori*. The purpose of this exercise is to investigate what happens to Arrow's Theorem when we replace the Pareto condition by the axiom of nonimposition.

(a) Show that the Pareto condition is strictly stronger than nonimposition. That is, show that every Paretian social welfare function is nonimposed and that there exists a nonimposed social welfare function that is not Paretian.

(b) Show that Arrow's Theorem ceases to hold when we replace the Pareto condition by nonimposition. That is, show that there exists a social welfare function that satisfies IIA and that is both nonimposed and nondictatorial.

Question 2 (10 marks)

Recall the proof of the Muller-Satterthwaite Theorem discussed in class and given in *Logic and Social Choice Theory*.

(a) Provide a high-level description of the proof. Write at most one page of text.

(b) In *Logic and Social Choice Theory* some details are "left as an exercise to the reader". State clearly what claims remain to be proven and provide a proof for one of them.

Question 3 (10 marks)

For the voting rule you have been assigned in class,

(a) find out how it works and prepare for presenting it in class in up to 90 seconds (on the blackboard), and

(b) find something positive to say about your voting rule and prepare for explaining what that is in a further 90 seconds.

You do not need to submit anything in writing.