

Homework #1

Deadline: Tuesday, 5 November 2013, 11:00**Question 1** (10 marks)

A social welfare function F is *nonimposed* if for every preference relation R there exists a profile (R_1, \dots, R_n) such that $F(R_1, \dots, R_n) = R$. 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)

We have seen definitions of *anonymity* and *neutrality* of social welfare functions in class. Adapt these definitions to social choice functions (i.e., to voting rules). How many (possibly irresolute) voting rules are there for 3 alternatives and 3 voters? How many of them are anonymous? How many are neutral? How many are both anonymous and neutral? How many are resolute? How many are resolute and anonymous? How many are resolute and neutral? How many are resolute, anonymous, and neutral? Justify your answers.

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 two minutes (on the whiteboard), and
- (b) find something positive to say about your voting rule and prepare for explaining what that is in a further two minutes.

Give your presentation on Monday in class. You do not need to submit anything in writing.