

Econ 2261 – Homework I

Provide a full justification for all your answers.

Due on 02/03

1. Which of the three minimal requirements discussed in class is violated by Borda's rule? Justify your answer thoroughly by providing an explicit instance in which the condition is violated and explaining why it is violated.
2. Consider the following SWF. Fix a preference ordering over alternatives denoted \succ^0 . For each pair of alternatives A and B , alternative A is considered to be socially preferred to alternative B if and only if $A \succ^0 B$. In other words, $\succ^* = \succ^0$, regardless of the individual's preferences.
 - (a) Does it satisfy universal domain?
 - (b) Does it satisfy unanimity?
 - (c) Does it satisfy independence of irrelevant alternatives?
 - (d) Is it a dictatorship?
3. Suppose a group of five friends is going to choose a movie to watch. There are five movies called A , B , C , D , and E , respectively. The friends' preferences are summarized in Table 1.
 - (a) Which alternatives are Pareto dominated?
 - (b) Which alternatives are Pareto efficient?
 - (c) What is the social ranking resulting from the Condorcet criterion?
 - (d) Can you tell from the information on the table which is the utilitarian alternative?

1	2	3	4	5
E	E	E	E	B
A	A	A	B	A
B	D	B	C	D
C	B	D	A	C
D	C	C	D	E

Table 1 – Preferences over movies

4. Determine which of the following statements are true and which are false.

- (a) There always exist a Pareto efficient alternative.
 - (b) There always exist a Pareto dominated alternative.
 - (c) The best alternative according to Rawlsian Justice is always Pareto efficient.
 - (d) The best alternative according to Borda rule is always Pareto efficient.
- 5.** Consider a competitive industry where all firms have identical cost functions $C(y) = y^2 + 1$ if $y > 0$ and $C(0) = 0$. Suppose that the demand curve for this industry is given by $D(p) = 52 - p$.
- (a) Find the individual supply curve of each firm.
 - (b) Suppose there are n firms in the industry. Find the industry supply curve.
 - (c) Find the price and quantity corresponding to a short-run market equilibrium assuming there are n firms in the market.
 - (d) Use the zero-profit condition to find the price in the long-run equilibrium.
 - (e) Find the number of firms and equilibrium quantity in the long-run.
- 6.** Let the industry demand be $D(p) = 100 - p$, and the industry supply be $S(p) = p$.
- (a) Find the equilibrium quantity and the equilibrium price
 - (b) Draw the demand and supply on a graph. Show on this graph the equilibrium, the consumer surplus and the producer surplus.
 - (c) Find the value of the producer surplus.
 - (d) Find the value of the consumer surplus.

Now let the government introduce a value tax of 50% paid by the producers.

- (e) Find the new consumer's surplus.
 - (f) Find the new producer's surplus.
 - (g) Find the government revenue.
 - (h) Find the deadweight loss.
- 7.** Consider an exchange Economy with a single good and two consumers (Anna and Bob). Suppose that Anna's utility function is $u_A = x_A$ while Bob's utility function is $u_B = 2x_B$. The total endowment of the good consists of one unit.
- (a) Find all Pareto efficient allocations.
 - (b) Find the utilitarian allocation.
 - (c) Find the Rawlsian allocation.

- (d) Are the preferences of Anna and Bob any different? Does it make sense to treat them differently? Briefly justify your answer.
- 8.** Consider an exchange economy with two goods (1 and 2) and two consumers (Anna and Bob). Anna's utility is $u_A = x_{A1}x_{A2}$, while Bob's utility is given by $u_B = x_{B1} + x_{B2}$. Initial endowments are $(3, 0)$ for Anna, and $(0, 2)$ for Bob.
- (a) Find all Pareto efficient allocations.
- (b) Find the competitive equilibrium.
- (c) Draw a clearly labeled Edgeworth box.
- (d) Are the preferences of Anna and Bob any different? Does it make sense to treat them differently? Briefly justify your answer.

[*Hint*: don't forget to check the boundaries of the Edgeworth Box]