Policy Analysis I, 88–220, Fall 1994 First Exam
Prof. John H. Miller Carnegie Mellon

[5] YOUR NAME: _____

Please show all relevant work and **clearly mark all of your final answers**. Points per question are indicated by the quantities in square brackets (200 points are possible—comprising 20% of your final grade). Answers should be short and concise (excessively long and rambling answers will be penalized). There are 6 main questions and the exam is 6 pages long.

Good luck.

[5] Draw something interesting in the space below:

1. A market consists of three buyers with values of \$15, \$10, and \$5, and four sellers with costs of \$6, \$9, \$12, and \$15. Suppose that the market is run and the \$15 buyer trades with the \$12 seller at a price of \$14, and the \$10 buyer trades with the \$6 seller at a price of \$8.

[10] Is the outcome of this market Pareto efficient (justify your answer with a specific example)?

[10] If a market results in an economically efficient outcome, what must be true about the total profits achieved by the buyers and sellers?

[10] In the diagram below plot the supply and demand curves underlying the market described above.

[10] Make a prediction of the equilibrium price and quantity, and provide a measure of the market efficiency that resulted from the two trades discussed above.

2. [30] What advantages do well-functioning markets have over central planning in making social decisions?

3. Instead of finishing their undergraduate degree in four years, many students consider taking an extra year to finish the degree.

[10] What are the obvious direct costs of such a decision?

[10] There are also considerable opportunity costs of such a decision. What are the opportunity costs?

[10] Make a rough estimate (in dollars) of the full *additional* economic cost of taking an extra year to finish your degree?

4. When students at CMU need to use a computer they have a choice between going to a cluster located close to their dormitory room verses walking across campus and using a computer in one of the main clusters. Suppose that it takes 10 minutes (5 minutes each way) to walk across campus to a main cluster, but once students arrive on campus a computer is always available. If, however, students go to the dormitory cluster, it takes no time to get there, but the waiting time in minutes will be equal to the number of people in the cluster divided by the number of computers in the cluster (for example, if there are 50 people and 25 computers, the waiting time will be 2 minutes). For the following questions, assume that students only care about their time walking to and from the clusters.

[10] Suppose that there are 100 people needing computers and 20 computers in the dormitory cluster. What is the total time that a student will spend getting a computer and returning to their room if they go to the dormitory cluster? How long will it take if they go to the main cluster? If an additional person showed up, which cluster would they go to?

[10] Suppose there are 200 people needing computers and 10 computers in the dormitory cluster. What is the best prediction about the number of people who will go to the dormitory cluster verses to those on the main campus?

[10] The 200 students needing computers complain to CMU because they can't find enough time in the day to finish their homework. CMU suggests a policy by which they will double the number of computers available in the dormitory cluster. Is this an effective policy? Why or why not?

5. For years CMU students have complained about the high cost of off-campus housing. The administration is considering the following program to alleviate this problem: each student living off campus will be given a voucher worth \$200 towards the rent of an off-campus apartment (the vouchers are given directly to the landlord who can then cash them in at CMU). Assume that the supply of off-campus housing offered is **NOT** responsive to changes in prices.

[10] Using the diagram below, draw the supply and demand curves (labeled S and D, respectively) before the policy is put into effect. label the equilibrium price and quantity as $P^\star$ and $Q^\star$ in the diagram.

[10] In the same diagram, draw in the new supply and demand curves (labeled S' and D', respectively), and indicate the equilibrium price and quantity as P_v and Q_v.

[10] Using the above results, should CMU implement the policy? Why or why not? (Assume CMU only cares about its student's welfare.)

6. Suppose that due to landfill space shortages, Pittsburgh requires that each home can only leave at most two standard size bags of trash for weekly pickup.

[10] Is the resulting situation Pareto efficient (why or why not)?

As an alternative, Pittsburgh gives each home 104 (52 weeks $\times$ 2) special bags per year, and will only pick up trash that is placed in these bags (regardless of the number of bags used). Each of the bags is coded to the respective house and cannot be used elsewhere.

[10] Does this policy improve efficiency (why or why not)?

[10] Suggest a market alternative that builds on the last idea and improves efficiency even more.