Econ 115
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and Teaching Fellows
Spring 2000

Midterm Exam

Follow all instructions carefully. There are 3 sections to the exam. Think before writing; be brief and concise. Do explain your answers and graphs, but excess verbiage will not be rewarded. Some questions are harder than others. If a question seems too hard, move on to another one and then return to the harder questions later. Do not panic, the exam will be curved.

No books, no notes, no calculators.

There are seventy points on the exam, so you should take about one minute per point, leaving a few minutes to read instructions and proofread your answers.

Unless indicated otherwise, all questions refer to perfectly competitive markets and all changes are short-run. You should explain each answer clearly and concisely.

On each bluebook you use, write your name, your TAs name and the exam section number.

NO SECTIONS THIS WEEK!

Answer Section I one on the next page, NOT IN A BLUE BOOK.
Section I: Short Definitions. 10 points total (2 points each). Define the following term in one or two sentences each. Answer this section on this sheet and turn it in with your bluebooks.

1. Opportunity Cost

2. Present Value

3. Sunk Cost

4. Elasticity of Demand

5. Pareto Optimal
1. The US and China produce textiles and cars.
   (a) (4 points) Draw PPFs for both countries and indicate points on the PPFs such that the US has a comparative advantage in cars.
   (b) (4 points) Give a (brief) argument for why both countries will be made better off if the the US sends cars to China in return for textiles.
   (c) (2 points) Will everyone in both countries be better off as a result of such a trade? Why or why not?

2. Consider the supply and demand for milk.
   (a) (2 points) Draw a supply and demand diagram indicating the equilibrium price and quantity of milk.
   (b) (2 points) Why wouldn’t a higher than equilibrium price persist in the market?
   (c) (2 points) Now suppose that the government puts a 10 cents per gallon tax on milk. Graph the new equilibrium and show how the burden of the tax is shared between the producers and consumers.
   (d) (2 points) Indicate the lost “economic surplus” that results from the tax.
   (e) (2 points) How would the burden of the tax change if the demand curve was less elastic?

3. Jane divides her 18 waking hours into Study (S) and Leisure (L). Her marginal utility of Study is $1_S$ and her marginal utility of Leisure is $2_L$.
   (a) (5 points) State the equations that determine Jane’s choice of how much to study in a day.
   (b) (3 points) Solve these equations to find Jane’s optimal hours of study.
   (c) (2 points) On a graph, show how Jane’s decision will change if she decides to sleep more, so that she has only 15 waking hours for Study and Leisure.

Section III. Answer this section in a separate blue book labeled “Part III”. Write your name and your teaching fellow’s name on the bluebook. Be sure to explain each answer, clearly and briefly.

This section has 30 points total, 10 points each question.

1. John consumes only spam and hotdogs. Say that the price of hotdogs goes up.

   (a) (5 points) Consider the “substitution effect” of the price increase: what does this effect (by itself) imply for John’s consumption of spam? Graph this effect.

   (b) (5 points) Relative to his original consumption point, what do we know about the change in John’s consumption of spam? (definitely higher, definitely lower, possibly either higher or lower)?
   
   if [i] spam is an inferior good or else [ii] spam is a normal good?


   (a) (3 points) First assume that $K$ is fixed in the short run. Show graphically how to derive the company’s short-run demand for labor (as a function of the wage, $w$.)

   (b) (4 points) Now assume that $K$ is not fixed and graph the company’s optimal input choices assuming an output level of 1000 widgets. Explain your graph.

   (c) (3 points) Show how your answer to the last question would change if the price of capital went down.

3. Say that IBM (in the US) and Acer (in Taiwan) both make identical computer chips. They have the MC curves show in the following graph:

   [insert graph here: two upward sloping MC curves, the higher labelled IBM and the other labelled Acer.]

   Note that IBM’s marginal costs are higher than Acer’s at every possible output level.

   (a) (2 points) Graph the profit-maximizing outputs of the two firms assuming perfect competition.

   (b) (4 points) Given the competitive outputs, can you take output away from IBM and re-allocate it to Acer and reduce costs? Why or why not.

   (c) (4 points) Say that the US puts a tax on the production of computer chips in the US but Taiwanese production is untaxed. Will post-tax total market output be produced at least cost?