

Instructions: (1) On the cover of your blue book, write **your name**, your TA's name, and your **section**. (2) Allocate your time taking account of how many points each question is worth. (3) To get full credit on answers, you must be clear, be rigorous, and thoroughly explain your answer in words (but be succinct). You should use a graph for most problems, the graph should be clearly **labeled**, and you must interpret the graph in words. (4) You cannot get credit unless you write something down: Give partial answers if you cannot give complete answers. (5) Answer *only* the number of questions specified—You will *not* get extra credit for answering more than the specified number. (If an extra question is answered, the TAs will ignore the last one.) Numbers in parentheses indicate how many points various subparts of problems are worth.

15-point questions: Answer only 4 of the 5 questions in this section:

A1. There are two markets, each of which has the same original equilibrium price and quantity but one market has a more elastic demand than the other at the equilibrium.

- A. Compare the incidence on consumers of a specific tax t between these two markets. (8)
- B. If the government can only assess the tax on one market and wants to maximize its tax revenue, which market should it tax and why? (7)

A2. A firm produces packages of shoelaces using a fixed-proportion production function: One box and two pairs of shoelaces are used to produce a complete package of laces.

- A. Draw the expansion path. Explain (8)
- B. If the factor price of a package rises, how will this expansion path change? Explain. (7)

A3. A utility-maximizing student with smooth, convex indifference curves spent her entire allowance on books (B) and movies (M) last month. This month, the per-unit book price doubles and the per-unit movie price triples. She complains to her parents, and as a result they increase her allowance so that, if desired, she could purchase the same bundle this month as she did in the last. Are the following statements true, false, or uncertain? (Use a graph to illustrate your answers and explain your answers.)

- A. She watches more movies and reads fewer books than last month. (8)
- B. She is just as well off as she was last month. (7)

A4. A firm that manufactures plates has an outlet store located next to its factory. There it sells first-quality plates (no defects) at price p_f and second-quality plates (minor defects) at a lower price, p_s . The firm also has stores elsewhere in the country. It costs the firm s to ship each plate to distant stores (and the shipping cost is added to the price of the plate). A consumer who lives near the outlet store and her twin who lives near one of the other stores have the same tastes, the same incomes, and both want to buy plates. Which twin is likely to buy relatively more second-quality plates? How does your answer depend on (i) their income elasticities and (ii) the relative share of their income they spend on plates? Explain your answer using graphs as needed.

A5. A firm's production function is $q = KL + L$, where q is output, K is hours of capital services and L is hours of labor.

- A. Does this production function exhibit increasing, constant, or decreasing returns to scale? Explain. (5)
 - B. The firm operates so as to minimize its costs and faces a wage of $w = \$1$ per hour of work and a rental rate of capital of $r = \$2$. If it uses 10 units of L , how many units of K does it use (explain your answer)? (8)
- How many units of output does it produce? (2)

20-point Questions: Answer only 2 out of the 3 questions in this section:

B1. Suppose the U.S. domestic demand function for a product is $Q_d = 100 - p$, the U.S. domestic supply function is $Q_s^u = 2p$, and the foreign supply (imports) is $Q_s^f = p$.

- A. What are the equilibrium price, imports, domestic production, and total quantity? (8)
- B. How does your answer change if the domestic government imposes a quota of 10 units on foreign imports? (12)

B2. Steve derives income from his job at McDonald's, which in turn allows him to consume goods. The job pays \$5 an hour and he has (of course) 24 hours each day to allocate between leisure and work. He is then given the additional opportunity to take on a salaried (not hourly) position as a GSI. If he takes the job, he is required to work EXACTLY 4 hours per day at this job, in turn receiving a lump-sum payment of \$40 per day. Assume that after putting in 4 hours as a GSI, he can work additional hours at McDonald's if he wishes to do so.

- A. Graph and label the original budget constraint and the budget constraint which includes the GSI opportunity. (10)
- B. Steve considers leisure an inferior good. If he originally works 6 hours per day at McDonald's, sketch both the original indifference curve and a possible new indifference curve. Explain your reasoning. (10)

B3. The U.S. government decides to place a tariff of t per bushel on foreign strawberries imported into the United States. [Note: A tariff is a "tax" placed only on importers and not on domestic producers.] Assume that consumers view U.S. and foreign strawberries as perfect substitutes

- A. Use a graph to show the effect of the tariff on the quantity of strawberries sold in the United States by U.S. growers, the quantity of imports sold, the U.S. market price, and the tariff revenues received by the U.S. government. (8)
- B. Who gains and who loses when the government imposes this tariff? Use your graph to show who gains and who loses among consumers, importers, and domestic suppliers (*hint*: you could use your graph to discuss the effect in terms of the incidence of the tariff—similar to the incidence of a tax). (12)