

Economics 479 - Fall 2003
Professor Yelowitz
Quiz 1 - 09/16/2003

Name _____
Student ID _____

This quiz is worth 25 points. You have 75 minutes. There are 5 questions altogether.

1. (5 points) Consider a consumer who has preferences over food and clothing, represented by the utility function $u = F^{\frac{3}{5}}C^{\frac{4}{5}}$, where F and C represent the quantity of food and clothing respectively. Suppose that $P_F = \$5$, $P_C = \$3$, and $I = \$500$. What quantity of food would this consumer demand?

2. (5 points) Suppose, instead that the utility function was $u = \min\left\{\frac{2}{3}F, \frac{2}{3}C\right\}$, and that $P_F = \$5$, $P_C = \$3$, and $I = \$500$. What quantity of food would this consumer demand?

3. (5 points) Suppose, instead that the utility function was $u = \frac{2}{3}F + \frac{2}{3}C$, and that $P_F = \$5$, $P_C = \$3$, and $I = \$500$. What quantity of food would this consumer demand?

4. (5 points) Consider an exchange economy (e.g., the edgeworth box model we reviewed in class). Evaluate the following statement: "If one person in the exchange economy starts off with all of the goods in the economy, then there is no possibility that they will trade with each other."

5. (5 points) Suppose that two people, Jerry and George, live on an island where there are two goods, food and clothing. The utility functions for Jerry and George are expressed as:

$$U_J = \min\left\{\frac{2}{3}F, \frac{2}{3}C\right\}$$

$$U_G = \frac{2}{3}F + \frac{2}{3}C$$

The total amount of food on the island is $F = 100$, while the total amount of clothing is $C = 200$. The initial allocation of the goods is:

$$F_J = 60, C_J = 80$$

$$F_G = 40, C_G = 120$$

Assume that the economy is perfectly competitive, and that Jerry and George can trade with each other.

a.) What allocation of food and clothing does Jerry end up with after trading, and what is his utility?

b) What allocation of food and clothing does George end up with after trading, and what is his utility?

Economics 479 - Fall 2002
Professor Yelowitz
Quiz 2 - 10/9/2003

Name _____
Student ID _____

This quiz is worth 25 points. You have 75 minutes. There are 2 questions (10 parts) altogether.

1. Assume that fireworks are a public good. Arnold, Billy, and Cruz have the following individual demand curves for fireworks. $P_A = 200 - Q_A$, $P_B = 100 - Q_B$, and $P_C = 50 - 2Q_C$ where Q_A , Q_B , and Q_C represent the amount of fireworks consumed by Arnold, Billy, and Cruz respectively. The marginal cost of producing another unit of fireworks is given by: $MC = 25 + \frac{1}{2}Q$.

1a. (3 points) Calculate the socially optimal quantity of fireworks.

1b. (3 points) If Billy and Cruz did not contribute at all for the fireworks, and Arnold provided his privately optimal quantity, what would be the deadweight loss to society?

1c. (3 points) Why will the fundamental welfare theorem be violated in the case of public goods? Why might government intervention lead to a more efficient outcome?

1d. (3 points) Evaluate the following statement: "Public housing projects are considered public goods, and will likely be under-provided by the private market."

2. As a by-product of its production, a perfectly-competitive steel firm dumps pollution into a river that harms a fisherman downstream. The demand curve facing the firm is: $P = 27 - \frac{1}{2}Q$. The steel firm's

marginal external cost of production is: $MEC = \frac{1}{2}Q$. The marginal social cost is: $MSC = 3 + 2Q$.

a. (2 points) Calculate the socially optimal level of steel production, Q_{SOCIAL} .

b. (2 points) Calculate the per-unit pigouvian tax that would achieve Q_{SOCIAL} .

c. (2 points) Calculate the deadweight loss if the steel firm ignored that fact that it produces an externality.

d. (2 points) Evaluate the following statement: "A monopolist's output always results in a smaller deadweight loss than a perfect competitor's output when negative externalities are present."

e. (2 points) Is the Coase Theorem likely to hold in this particular example?

f. (3 points) In this example, what is the largest bribe that the fishery is willing to give to the steel firm to move from Q_{PRIVATE} to Q_{SOCIAL} ? What is the smallest bribe that the steel firm would accept?

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Quiz 3 - 11/6/2003

Name _____
Student ID _____

This quiz is worth 25 points. You have 75 minutes. There are 2 questions altogether.

1. Jane lives in a state that offers assistance through the cash welfare (AFDC/TANF) program. The maximum benefit from this program is \$500 per month. Earnings in the amount of \$200 per month is allowed through a standard deduction before AFDC cash benefits begin to be reduced at a tax rate of 100 percent. Jane also receives Medicaid through the AFDC, which she values at \$100 per month. Assume throughout the problem that Medicaid eligibility is lost when AFDC eligibility is lost. Jane is endowed with 300 hours of leisure per month. The price of consumption goods is \$1. Jane's wage rate is \$5 per hour.

a. If Jane's preferences were represented by $U(L, C) = L^{\frac{2}{3}} C^{\frac{1}{3}}$, how many hours would she work in the absence of the welfare system?

For the remainder of the problem, disregard the utility function given in part a.

b. Draw the budget constraint facing Jane, clearly labeling the axes, intercepts and any kink points. Is there any range of hours which Jane will definitely not work? If so, what is this range? At what level of earnings is Medicaid eligibility lost?

Suppose the law requires all employers are required to provide health insurance equivalent to Medicaid to workers who work at least 250 hours per month.

c. Draw the new budget constraint facing Jane, clearly labeling the axes, intercepts and any kink points. Compared to part b., clearly illustrate what predictions can be made about labor force participation, hours of work, and AFDC participation.

Return to the original case where employers do not provide health insurance to their employees. Suppose the government eliminates half of the services that Medicaid provides (all the services are valued equally).

d. Compared to the case with full Medicaid services, will Medicaid spending fall by more, less, or exactly one-half? Why?

2. Assume that Kremer has preferences over mangos and cappuccino given by the utility function $U(M, C) = M^{\frac{1}{3}}C^{\frac{2}{3}}$. The price of mangos is \$4, while the price of cappuccino is \$5. His income is originally \$200. The government now decides give Kremer a transfer, and is debating two different transfer schemes:

Transfer #1: \$100 in cash or

Transfer #2: 12 mangos and 10 cappuccinos.

Kremer still keeps his original \$200, in addition to the transfer.

a. Clearly illustrate his budget constraint before the transfer, and how each of the transfer schemes changes the budget constraint.

b. In this particular example, is Kremer happier with Transfer #1 or Transfer #2?