Economics 100A
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Fall 2001

FINAL EXAMINATION SOLUTIONS (A)
December 13, 2001
Wheeler Auditorium (5–8 PM)

Name:_____

SID #: _____

GSI: _____

Instructions:

Mark only on the exam.
Do not separate pages.
Calculators are permitted.

MULTIPLE CHOICE (60 points: 2 points each)

For the following questions circle the ONE correct answer.

1. Judy has indifference curves between two contingent commodities. The first commodity is iced tea delivered if the day is warm; the second commodity is ice tea delivered if the day is cool. At a consumption vector in which Judy gets 5 units of each of the two commodities, her marginal rate of substitution is 3 glasses of cool-day ice tea per glass of warm-day ice tea. This MRS is determined by

   (a) Judy's tastes for iced tea at different temperatures.
   (b) July's beliefs about the probability of a warm day.
   (c) Both (a) and (b).
   (d) Judy's degree of risk aversion.

2. In an exchange economy in which there are N people identical to Al in terms of preferences and endowment, and N persons identical to Bev in terms of preference and endowment, the <u>core convergence theorem</u> states that as N increases:

   (a) The core shrinks to the contract curve.
   (b) The core shrinks to the Walrasian equilibrium.
   (c) The core and the initial endowment converge.
   (d) No individual consumer can strategically manipulate his or her offers.

3. The price elasticity of toll calls within the 510 area code, for which Pacific Bell is the only supplier, is estimated to be about -1.1. If rate for these calls is raised, Pacific Bell earns

   (a) more revenue
   (b) less revenue
   (c) same revenue
   (d) need more information

4. The amount of capital (K) a firm is willing to trade for a unit of labor (L) and still produce the same level of output is called

   (a) the marginal rate of substitution (MRS).
   (b) constant returns to scale (CRS).
   (c) the law of diminishing marginal product.
   (d) the technical rate of substitution (TRS).

5. A consumer's utility function over goods X and Y is U(X,Y)=XY + 10Y. Suppose this consumer has an income of $110, the price of good Y is $2, and the price of good X is $1. What is the optimal consumption bundle (X*,Y*) for this consumer?

(a) X*=30,Y*=40
(b) X*=40,Y*=35
(c) X*=50,Y*=30
(d) X*=60,Y*=25

6. A monopolist faces an inverse demand curve, $P(Y) = 12 - Y$, and a total cost curve, $C(Y) = Y^2$. Which of the following is the profit maximizing level of output for the firm?

(a) Y=2
(b) Y=4
(c) Y=12
(d) Y=3

7. Consider the game between two rival firms. Firm Americorp operates in the U.S., and Firm Eurocorp operates in France. Each is considering expanding into the other's market. Their net profits are given in the following table:

		Eurocorp (France)	
		Not Expand	Expand
Americorp (USA)	Not Expand	(A,B)	(E,F)
	Expand	(C,D)	(20,10)

If Expand is a dominant strategy for Americorp, then

(a) 10 > D and 20 > E
(b) F > B and 10 > D
(c) C > A and 20 > E
(d) A > C and B > F

8. Suppose at a particular bundle (X_1, X_2) along the budget line, the $MRS = dX_2/dX_1 = -2$. The slope of the budget line is $-p_1/p_2 = -3$. The consumer can increase utility subject to the budget constraint by

   (a) Increasing consumption of X_1 and keeping X_2 fixed.
   (b) Increasing consumption of X_2 and keeping X_1 fixed.
   (c) Increasing consumption of X_2 and decreasing consumption of X_1.
   (d) Increasing consumption of X_1 and decreasing consumption of X_2.

9. Suppose X_1 and X_2 are <u>perfect substitutes</u> and the $MRS = dX_2/dX_1 = -1$. If income is m and prices satisfy $p_1 < p_2$, then which of the following characterizes the optimal consumption bundle?

   (a) $X_1^* = m/p_1, X_2^* = 0$
   (b) $X_1^* = m/2, X_2^* = m/2$
   (c) $X_1^* = 0, X_2^* = m/p_2$
   (d) cannot be determined

10. Consider the following normal-form game. What are the <u>pure-strategy</u> Nash Equilibria of this game?

	L	C	R
T	(2,0)	(1,1)	(4,2)
M	(3,4)	(1,2)	(2,3)
B	(1,3)	(0,2)	(3,0)

   (a) (M,L) only
   (b) (T,R) only
   (c) (M,L) and (T,R)
   (d) No pure strategy Nash Equilibria exist

11. A competitive firm produces identical outputs at two different plants. If the marginal cost at the first plant is above market price and marginal cost at the second plant is less than market price, then to increase profit the firm should

   (a) increase output in the first plant and decrease it in the second plant.
   (b) increase output in both plants.
   (c) decrease output in both plants.
   (d) decrease output in the first plant and increase it in the second plant.

4

12. Assume smooth, strictly convex preferences. In an Edgeworth box that gives the feasible allocations of two goods between two consumers, the contract curve connects all points of

(a) tangency between the indifference curves of the two consumers.
(b) intersection for the indifference curves of the two consumers.
(c) tangency between the indifference curve and budget constraint of one consumer.
(d) intersection between the indifference curve and budget constraint of one consumer.

13. Assuming downward sloping demand, if long-run competitive supply is perfectly (i.e. infinitely) elastic, then a sales tax is

(a) entirely passed on to consumers.
(b) mostly passed on to consumers.
(c) mostly absorbed by producers.
(d) entirely absorbed by producers.

14. The supply function for apartments is $Q=20+2P$. The demand function for apartments is $Q=100-2P$. The civic authorities impose a price ceiling of \$15 per week. To avoid a housing shortage, the authorities agree to pay landlords a large enough quantity subsidy so that supply equals demand. How much is the weekly subsidy per apartment needed to eliminate excess demand from the price ceiling?

(a) \$5 per apartment/week
(b) \$10 per apartment/week
(c) \$15 per apartment/week
(d) \$20 per apartment/week

15. In duopoly, if firms can guarantee to consumers that they will "meet" a rival's price, this will lead in Nash equilibrium to

(a) higher prices than in equilibrium without guarantees.
(b) lower prices than in equilibrium without guarantees.
(c) no predictable effect on prices.
(d) same prices as in equilibrium without guarantees.

16. Which of the following conditions will NEVER hold when the long-run supply of a competitive firm is positive (i.e. the firm is producing a non-zero quantity)?

(a) Price equals marginal cost and marginal cost is rising.
(b) Price equals marginal cost and marginal cost is falling.
(c) Profit is positive.
(d) Long-run marginal cost = short-run marginal cost.

17. If the wage rate rises, leisure-time is a normal good, and labor supply is the consumer's endowment of time on each day minus time spent in leisure, then

(a) the substitution effect raises the consumer's supply of labor.
(b) to keep the consumer on the same indifference curve, income must rise.
(c) the income and substitution effects for leisure demand go in the same direction.
(d) the consumer moves to a lower indifference curve.

Consumer 2
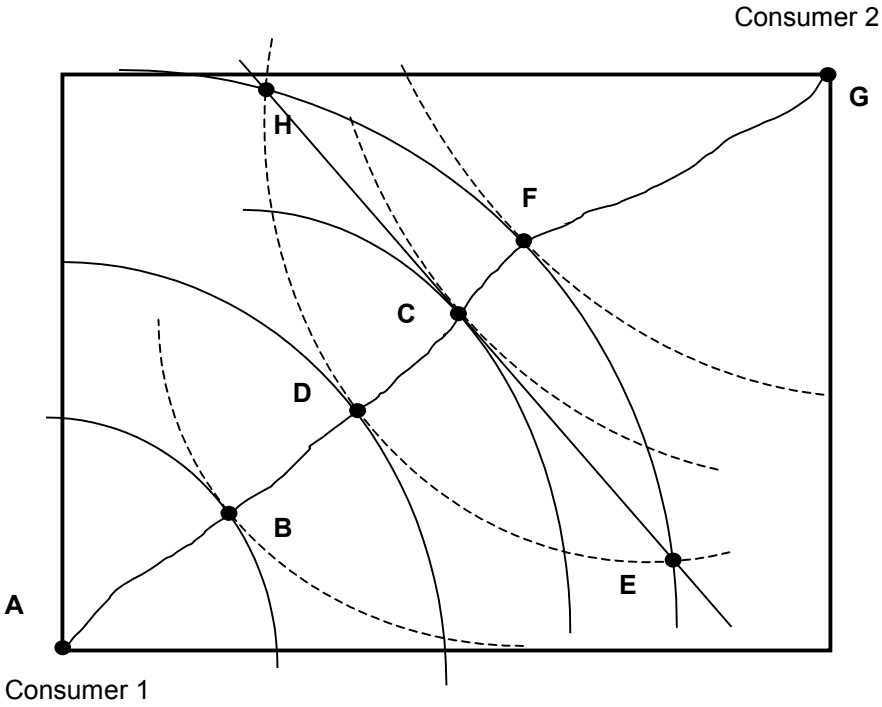
Consumer 1

The Edgeworth box above gives the feasible allocations in a two-good, two-person economy. The endowments of the consumers are at point E. Use the diagram to answer the next TWO questions:

18. The set of Pareto efficient points is given by

    (a) the segment of curve DCF with endpoints D, F that goes through C.
    (b) the lens shaped area bounded by EFHD
    (c) the line segment HCE with endpoints H and E that goes through C.
    (d) the curve ABDCFG with endpoints A, G.

19. The Walrasian competitive equilibrium allocation is given by

    (a) Point E
    (b) Point F
    (c) Point C
    (d) Point D

20. Education is sometimes viewed as generating a positive externality to a democratic society because those educated individuals are more likely to think carefully and vote rationally. If this is true, then

    (a) society is free riding on the investment in education made by individuals.
    (b) individuals choose less education than is socially desirable.
    (c) there is a deadweight loss that could be eliminated by subsidizing students.
    (d) all of the above.

21. Which of the following is an example of a free rider problem?

    (a) Watching, but not contributing to your local public TV station.
    (b) Sneaking into a movie without paying.
    (c) Buying second-hand items.
    (d) Reading a library book.

22. Suppose that long-run average cost (LRAC) is minimized at only <u>one</u> level of output, 100 units. If the firm is in long-run equilibrium and currently producing 110 units, then which of the following statements is true at the <u>current</u> output (110 units)?

    (a) LRAC=LRMC.
    (b) SRAC=SRMC.
    (c) LRAC=SRAC.
    (d) all of the above.

23. In the short-run, a firm increases its labor input from 10 to 11 workers and output increases from 500 to 560 units. Which of the following statements is correct?

(a) The average product of 11 workers is 50.
(b) The marginal product of the 11th worker is 50.
(c) The average product of 11 workers is 60.
(d) The marginal product of the 11th worker is 60.

24. An allocation of goods among consumers is Pareto-efficient if

(a) the poorest member of society is made better off.
(b) all consumers have equal utility.
(c) no consumer can be made better off without another being made worse off.
(d) no consumer's utility can be increased.

25. If a lump-sum tax is lowered in year 1, but a lump-sum tax is increased in year 2 in such a way that the present value of income is unchanged, consumption will

(a) increase in year 1 and decrease in year 2.
(b) increase in both year 1 and year 2.
(c) be unchanged.
(d) increase in year 2 and decrease in year 1.

26. Long-run average cost (LAC) for a competitive firm is minimized at 80 units. If at this output LAC = $6 and if the price of the good is $7, then the firm should

(a) produce 80 units.
(b) produce more than 80 units.
(c) produce less than 80 units.
(d) shut down.

27. A successful cartel in an oligopolistic industry will be able to

(a) reduce output and reduce price.
(b) increase output and reduce price.
(c) reduce output and increase price.
(d) increase output and reduce price.

28. Andrew studies Economics 100A intensively, argues every point, and gets a grade of A+. Sam crams the night before the final exam, and gets a grade of C-. Both Andrew and Sam apply for a laboratory job doing recombinant DNA research, a job that requires absolutely no knowledge of economics. Both Andrew and Sam have identical training and identical grades in biology, yet Andrew gets the job. This is an example of

    (a) a return to Andrew's investment in human capital.
    (b) Andrew's performance signaling that he is a hard working "gem".
    (c) grade inflation.
    (d) market failure due to externality.

29. Consider standard downward sloping demand and upward sloping supply. The government proposes a quantity tax (i.e. a specific tax or per-unit tax) of t. Which of the following implies the smallest deadweight loss from this tax?

    (a) Both demand and supply are extremely inelastic.
    (b) Both demand and supply are extremely elastic.
    (c) Demand is extremely inelastic but supply is extremely elastic.
    (d) Demand is extremely elastic but supply is extremely inelastic.

30. Suppose there are two goods in the economy, good X and good Y. If the consumer is endowed with quantities of X and Y such that he is a NET SUPPLIER of good X, then which of the following MUST be true if the price of good X <u>increases</u>?

    (a) Utility will decrease
    (b) Utility will increase
    (c) Consumer will consume more good X
    (d) Consumer will consume less good X

SHORT ANSWER (40 points: 8 points each)

Answer the questions in the space provided. Show all work.

31. Suppose your utility as a function of income is $U(Y)=Y^{1/2}$. You have $300 in income. I shuffle a deck of cards. If you cut the deck and turn up a spade, you win $100. Otherwise, you lose $44. (Note: the probability of turning up a spade from a 52 card deck is $\pi=1/4$).

    (a) What is your expected utility from this gamble?

    $EU = 0.25(400^{0.5}) + 0.75(256^{0.5}) = 5 + 12 = $ **17**

    (b) What is the certainty equivalent level of income? In other words, what is level of income for <u>certain</u> that would make this consumer just as well off as under the gamble?

    $CE: 17 = (Y^{0.5}), Y^2 = 17, Y = $ **289**

SHORT ANSWER (CONT'D)

Answer the questions in the space provided. Show all work.

32. Suppose the demand for cigarettes is $Q = 15 - 0.5P$ and the supply of cigarettes is $Q = P - 3$, where P is the price per pack of cigarettes. Suppose the government imposes a cigarette tax of $3 per pack.

    (a) What is the price paid by producers?

    $15 – 0.5(P – 3) = P – 3$, $3P = 33$, $P = 11.

    (b) What is the price faced by consumers?

    $P + 3 = 14.

    (c) What is the government revenue from the tax?

    *$Q = 8$, $P*Q = 3*8 = 24.*

    (d) What is the <u>total</u> dollar amount of tax revenue that is ultimately paid by consumers (i.e. consumers' tax burden)?

    *$(14 – 12)*8 = 16.*

SHORT ANSWER (CONT'D)

Answer the questions in the space provided.   Show all work.

33. Helen spends all her money on food and clothing. When the price of clothing decreases, she ends up buying more clothing. (Note: In the following questions, be clear about the direction of the effect as increasing, decreasing, or ambiguous.)

    (a) Does the substitution effect cause her to buy more or less clothing? Explain.

    The substitution effect causes her to buy more clothing. Clothes are cheaper than they were before (relative to food), and therefore she substitutes towards the cheaper good. The substitution effect is unambiguous in this and all cases

    (b) Does the income effect cause her to buy more or less clothing? Explain.

    The direction of the income effect is ambiguous. We were never told if clothing is a normal or inferior good, so we don't know whether clothing consumption increases with an increase in real income (normal) or decreases with an increase in real income (inferior). All we know is that in net, she buys more clothing. If clothing is normal both the substitution and income effects move in the same direction (more clothing). If clothing is inferior the substitution and income effects move in opposite directions but--since we know the net effect--the substitution effect (more clothing) is larger than the income effect (less clothing).

    (c) Under what circumstances will a price <u>decrease</u> result in Helen buying (on net) <u>less</u> clothing? Explain.

    Helen would buy less clothing (on net) if the income effect were larger than the substitution effect. A good of this type is possible though rarely observed (it implies an upward-sloping demand curve). This type of good is defined as a "Giffen good".

SHORT ANSWER (CONT'D)

Answer the questions in the space provided. **You do not need to explain your answers for this problem.**

34. In each of the cells in the table below, indicate whether the statement is true (T), false (F), or uncertain (U) for a monopolist and for a competitive firm. Assume the competitive industry is one in which all firms are identical.

	Monopolist	Competitive Firm
The profit maximizing firm will produce where MR= MC	T	T
The firm's MR = Price	F	T
The market demand will be elastic at the quantity supplied by the industry	T	U
A below-market price ceiling (that exceeds minimum AVC) increases output in the short-run	U	F
In the long-run, the firm always produces at the minimum of the average cost curve	F	T

Answer the questions in the space provided. Show all work.

35. Sal's satellite company broadcasts TV to subscribers in Los Angeles and New York. The demand functions for each of these two groups are: $Q_{NY} = 50-(1/3)P_{NY}$ and $Q_{LA} = 80-(2/3)P_{LA}$, where Q is in thousands of subscriptions per year, and P is the subscription price per year. The cost of providing Q units of service is given by $C(Q) = 1000 + 30Q$, where $Q = Q_{NY}+Q_{LA}$. If the company is a monopoly and can engage in <u>third-degree</u> price discrimination, then

    (a) What is the profit-maximizing price and quantity in the New York market?

    Set MR = MC. $150 – 6Q_{NY} = 30$. $Q_{NY} = 20$, $P_{NY} = 90$.

    (b) What is the profit-maximizing price and quantity in the Los Angeles market?

    Set MR = MC. $130 – 2Q_{LA} = 30$. $Q_{LA} = 30$, $P_{LA} = 75$.

    (c) Suppose Sal can only charge a single price. What price should he charge, and what is the total quantity sold?

    Market Supply: $130 – P$. Set MR = MC. $130 – 2Q = 30$. $Q = 50$, $P=80$.