

Name:

Matrikel-Nr.

Examination: Intermediate Microeconomics

Wintersemester 2000/2001

Examiner : Dr. Carsten Helm

The following aids can be used: Pocket calculators according to the note of the examination office

Examination questions:

Part I: Multiple Choice Questions (50 points)

Please return these pages.

In each of the following questions, exactly one answer is right. Therefore, you must not mark more than one answer as the right one. For every right answer, you get two points. For every wrong answer, you get one minus point. If you do not mark any of the three possible answers to a question, you get zero points for this question. Finally, if you leave the multiple choice part with a score of less than zero, this will be set equal to zero.

1. Suppose the production function is $f(x_1, x_2) = x_1^{4/5} x_2^{1/5}$, where $x_1, x_2 > 0$. The marginal product of the first input x_1 is
 - a) constant.
 - b) increasing.
 - c) decreasing.

2. Suppose the production function is $f(x_1, x_2) = x_1^{5/6} x_2^{1/6}$. The returns to scale of this production function are
 - a) increasing.
 - b) constant.
 - c) decreasing.

3. Which of the following statements is **wrong**?
 - a) Luxury goods have an income elasticity of demand that is greater than 1.
 - b) Normal goods have a constant income elasticity of demand.
 - c) Inferior goods have a negative income elasticity of demand.

4. Which of the following statements is **wrong**?
 - a) Average fixed costs never increase with output.
 - b) Average total costs are always greater than or equal to average variable costs.
 - c) Average cost can never rise, while marginal costs are declining.

5. A firm has a cost function given by $c(y) = 10y^2 + 1000$. Average cost are minimized at an output y of
- a) 0.
 - b) 10.
 - c) 100.
6. If a consumer has a utility function $u(x_1, x_2) = x_1x_2^4$, what fraction of her income will she spend on good 2?
- a) 3/4.
 - b) 4/5.
 - c) the whole income.
7. The demand function for fresh strawberries is $q = 130 - 4p$, and the supply function is $q = 60 + 3p$. What is the equilibrium price?
- a) 10.
 - b) 20.
 - c) 40.
8. A consumer has a utility function $u(x_1, x_2) = \sqrt{x_1} + x_2$. On a diagram we put x_1 on the horizontal axis and x_2 on the vertical axis. We draw some indifference curves. Now we draw a straight line and we notice that where this line meets any indifference curve, the indifference curves all have the same slope. The straight line we drew is
- a) vertical.
 - b) horizontal.
 - c) none of the above.
9. Jack's utility function is $u(x_1, x_2) = 2x_1x_2$. His marginal rate of substitution at the point (3,4) is
- a) -1.
 - b) -3/2.
 - c) -4/3.
10. Which statement is right? Profit maximization of a firm
- a) presupposes cost minimization.
 - b) is a necessary condition for cost minimization.
 - c) is equivalent to cost minimization.
11. Jane consumes positive quantities of both honey and sugar. The price of honey is 5 Pfennig per unit and the price of sugar is 1 Pfennig per unit. Her marginal utility of honey is 3 and her marginal utility of sugar is 2.
- a) Without changing her total expenditures, she could increase her utility by consuming more honey and less sugar.
 - b) Without changing her total expenditures, she could increase her utility by consuming more sugar and less honey.
 - c) Without changing her total expenditures on honey and sugar, she could not increase her utility.

12. The profits of firm 1 and firm 2 depending on their actions are given in the following matrix. (Firm 1 can choose between U and D, firm 2 can choose between L and R). The upper lefthand corner of each field gives the profits of firm 1, the lower righthand corner gives the profits of firm 2. Which statement is right?

- a) (U,L) is a Nash-equilibrium but not an equilibrium in dominant strategies.
 b) (U,L) is an equilibrium in dominant strategies but not a Nash-equilibrium.
 c) (U,L) is an equilibrium in dominant strategies and a Nash-equilibrium.

		Firm 2	
		L	R
Firm 1	U	4 4	1 3
	D	2 1	5 0

13. The profits of firm 1 and firm 2 depending on their actions are given in the following matrix. (Firm 1 can choose between U and D, firm 2 can choose between L and R). The upper lefthand corner of each field gives the profits of firm 1, the lower righthand corner gives the profits of firm 2. Which statement is right?

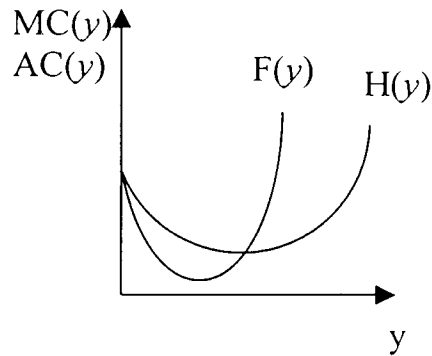
- a) (U,L) is a Nash-equilibrium.
 b) (D,L) is a Nash-equilibrium.
 c) there is no Nash-equilibrium.

		Firm 2	
		L	R
Firm 1	U	4 4	0 5
	D	3 6	1 1

14. As assistance vice president in charge of production for a computer firm, you are asked to calculate the minimal cost of producing 100 computers. The production function is $f(x, y) = \min\{x, 2y\}$. The price of x is 18 and the price of y is 10. What is your answer?

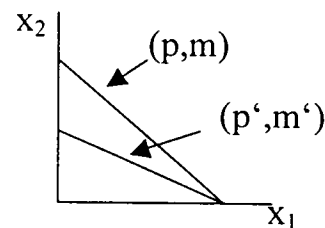
- a) 1000.
 b) 2300.
 c) 3800.

15. A firm produces the good y with marginal cost $MC(y)$ and average costs $AC(y)$. The diagram shows both curves. Which statement is right?
- a) $F(y)$ is marginal costs and $H(y)$ is average costs.
 - b) $H(y)$ is marginal costs and $F(y)$ is average costs.
 - c) Without further information, no answer is possible.



16. The indifference curves of a consumer are straight lines and the consumer is indifferent between the bundles of goods $(1,4)$ and $(7,2)$. Which statement about the bundle $(4,3)$ is right?
- a) The consumer strictly prefers the bundle $(4,3)$ over the other two bundles.
 - b) The consumer is indifferent between all three bundles.
 - c) The consumer strictly prefers the bundles $(1,4)$ and $(7,2)$ over the bundle $(4,3)$.
17. The compensating variation and the equivalent variation are the same for
- a) Cobb-Douglas utility.
 - b) quasilinear preferences.
 - c) perfect substitutes.

18. Consider the following price-budget situations, where $m > m'$. Which statement must be true?
- a) $p_1 > p'_1$
 - b) $p_1 = p'_1$
 - c) $p_1 < p'_1$.



19. Given is a consumer with a Cobb-Douglas utility function $u(x_1, x_2) = x_1^{1/3} x_2^{2/3}$ and income $m = 100$. The prices of the two goods are $p_1 = p_2 = 2$. Which of the following would change the consumer's demand?
- a) Multiplying his utility function by 2 and subtracting 100 from it.
 - b) Increasing all prices and his income by DM 2.
 - c) Multiplying all prices and his income by 3.2.
20. A firm has the following production function: $f(x_1, x_2) = \min\{x_1, x_2\}$. If output remains constant and the price for input x_1 doubles,
- a) the firm increases demand for input x_1 .
 - b) the firm decreases demand for input x_1 .
 - c) the firm does not change its demand for input x_1 .

21. If the demand for tickets to a play is $q = 480 - 20p$, at what price will a monopolist maximize total revenue?
- a) 10.
 - b) 12.
 - c) 24.
22. The demand function for bananas is $q = 50 - 0.5p$, where p is the price in Euro per crate and where q is the number of crates of bananas demanded per week. When $p = 20$, what is the price elasticity of demand for bananas?
- a) $-1/4$.
 - b) $-1/2$.
 - c) -1 .
23. Angela consumes only two goods, x and y . Her income doubles and the price of the two goods remain unchanged. Assuming that she is a utility maximizer and likes both goods, which of the following statements is necessarily true?
- a) The ratio of her consumption of x to y remains constant.
 - b) She will increase her consumption of both goods.
 - c) None of the above.
24. If there are two goods and if income and the price of good 1 doubles, while the price of good 2 stays constant:
- a) A consumer's demand for good 1 will increase only if it is a Giffen good for her.
 - b) A consumer's demand for good 2 will decrease only if it is a Giffen good for her.
 - c) A consumer's demand for good 2 will decrease only if it is an inferior good for her.
25. A profit maximizing monopolist, who produces a positive amount of output, always sets
- a) price equal to average costs.
 - b) price equal to marginal revenue.
 - c) marginal revenue equal to marginal costs.

Part II: Discussion (20 points) Answer one of the following questions:

Alternative 1

The mayor of Magdeburg wants to make his city more attractive for students. For that purpose, he considers to subsidize students' housing.

- a) Demonstrate *graphically* that there is an excess burden associated with the subsidy on housing. Briefly explain in words the reasons for the excess burden. (15 %)
- b) Is there an alternative policy, which would make students better off than the subsidy on housing without costing more money? (5 %)

Alternative 2

- a) What is a natural monopoly? (3 %)
- b) It seem that to eliminate the inefficiency of a monopoly, the regulator simply has to set price equal to marginal costs, and profit maximization will do the rest. Show graphically that the monopolist might make negative profits at such a price and prefer to go out of business. (12%)
- c) Briefly discuss other options of regulating a natural monopoly. (5%)

Part III: Analytical Part (20 points)

A firm uses a single input to produce a commodity according to a production function $f(x) = 4\sqrt{x}$, where x is the number of units of input. The commodity sells for DM 100 per unit. The input costs DM 50 per unit. Furthermore, there are fixed costs of DM 200 and there is perfect competition.

- a) Write down a function that states the firm's profits as a function of the amount of input. (3 %)
- b) What is the profit maximizing amount of input? How much profits does the firm make when it maximizes profits? (4 %)
- c) What is the firm's producer's surplus? (3 %)
- d) Suppose that the firm is taxed DM 25 per unit of its output. What is the new profit maximizing input level? How much profits does the firm make now? (4 %)
- e) Suppose that instead of these taxes, the firm is taxed at 50% of its profits. Write down its after-tax profits as a function of the amount of input. What is the new profit maximizing input level? How much profits does it make after taxes? Compare the result with that of question (b). (6 %)