Final Exam: 5016 Principles of Economics I

Examiner: Prof. Dr. Schwödiauer

Term: Winter 2004/05

No aids permitted except for language dictionaries without any marking and non-programmable pocket calculators without communicating and/or data processing functions.

There are 40 different problems on this exam. Make sure that this copy of the exam is complete and write your matriculation number and your name into the appropriate fields on top of this page. Work on all 40 problems. Do not mark more than one possible solution, otherwise the problem is considered to be incorrectly solved. For every correct solution you obtain two points. For every incorrect solution one point is subtracted. If no solution is marked you neither obtain nor lose a point. If no solution is marked you neither obtain nor lose a point. In order to pass this exam you need at least 27 points.

1. Suppose that two lawyers want to end a partnership that is worth 1,500,000€. Moreover, lawyer 1 used to work 40 hours per week for the partnership and lawyer 2 used to work 10 hours per week for the partnership. Both lawyers have to agree on how to split the value of the partnership. Which of the following statements is true?

   a) In the unique Pareto-efficient allocation, each lawyer gets 750,000€.
   b) In the unique Pareto-efficient bargaining outcome, lawyer 1 gets 1,200,000€ and lawyer 2 gets 300,000€.
   c) There are infinitely many Pareto-efficient allocations since any distribution is Pareto-efficient.

2. An economic model that analyzes the welfare effects of an increase of a quantity tax in some industry characterized by a monopoly is typically a part of

   a) Econometrics.
   b) Microeconomics.
   c) Macroeconomics.

3. It follows from data generated in Dictator Game and Ultimatum Game experiments that

   a) subjects tend to be completely altruistic.
   b) subjects typically do not fear offer rejections.
   c) subjects fear offer rejections and appear to be more altruistic than they are.

4. An example of economic experimental data is data

   a) on corporate annual profits of eBay.
   b) on sales prices at eBay resulting from random and uncontrolled auctions.
   c) on sales prices at eBay resulting from nonrandom and controlled auctions.

5. Suppose the profit of fishery F decreases as upstream manufacturer M increases its level of production due to increased pollution. It follows that by increasing production, manufacturer M

   - a) imposes a negative externality on fishery F.
   - b) imposes a positive externality on fishery F.
   - c) imposes no externality on fishery F.

6. Emily thinks about visiting a Robbie Williams Concert where she already bought a ticket. If she decides not to go, she resells the ticket for 100€. Her best alternative to enjoying Robbie Williams on stage is babysitting. Then, she earns 25€. If she visits the Concert, then her opportunity cost of the time she devotes to it is

   - a) 125€.
   - b) 0€.
   - c) 25€.

7. What is a typical example for a capital good in the economic sense:

   - a) steel in bridge construction.
   - b) printed menus in restaurants.
   - c) ink in the production process of final exams.

8. Suppose the market for mathematical textbooks in Micromania can be described by $D(P) = 1000 - 2P$ and $S(P) = 400 + 4P$ where P denotes the price level.
   Mark the correct market equilibrium quantity:

   - a) $Q^* = 100$
   - b) $Q^* = 800$
   - c) $Q^* = 400$

9. Consider the market for mathematical textbooks in Micromania with $D(P) = 1000 - 2P$ and $S(P) = 400 + 4P$ where P denotes the price level. Total gains from trade accruing to households in equilibrium (measured by consumer surplus) equal:

   - a) 640,000.
   - b) 320,000.
   - c) 160,000.

10. If the government requires buyers of mathematical textbooks in Micromania to pay a tax of $t = 30$ for each textbook sold where $D(P^B) = 1000 - 2P^B$ and $S(P^S) = 400 + 4P^S$ and P^B denotes the price paid by buyers and P^S the price received by sellers (net of tax), then

   - a) the price buyers pay equals the price received by sellers.
   - b) the price buyers pay in equilibrium is 120.
   - c) the price buyers pay in equilibrium is 90.

11. Consider the mentioned market for mathematical textbooks in Micromania with $D(P^B) = 1000 - 2P^B$ and $S(P^S) = 400 + 4P^S$ where P^B is the price paid by buyers and P^S is the price received by sellers (net of buyers). The equilibrium tax revenue of quantity tax $t = 30$ is:

   - a) 24,000.
   - b) 24,600.
   - c) 22,800.

12. Consider the market for apartments in M. If the population of M. falls over time, ceteris paribus, it is most likely that the market equilibrium price for apartments will tend to

- a) increase.
- b) decrease.
- c) remain unchanged.

13. Since the quantity of supplied oil in market equilibrium increased, the market price must have

- a) increased
- b) decreased
- c) responded in a way which cannot be predicted from the quantity movement alone

14. Suppose that goods X and Y are complements and that both markets are in equilibrium. If demanders for both goods suddenly come to expect that consumption of good X increases the probability of becoming increasingly handsome and therefore adjust their demand upwards, it is most likely that the market price of good Y

- a) increases.
- b) decreases.
- c) remains constant.

15. In the short run the existence of a price floor lower than the equilibrium price generates

- a) always a market equilibrium where demand equals supply.
- b) always some form of rationing.
- c) sometimes some form of rationing.

16. Two estimated points of the supply function in the labor market for yoga teachers in Magdeburg are (P=16 €, Q=15,000 hours) and (P=6 €, Q=5,000 hours) where P denotes the hourly wage level and Q the corresponding supply of yoga hours. Use the average method to calculate the price elasticity of supply:

- a) $E_S = 11/10$.
- b) $E_S = 10/11$.
- c) $E_S = 1$.

17. The marginal product of an artist is constant at two pictures per week (independently of the number weeks worked.) It follows that the average product with ten weeks worked is given by

- a) 20 pictures.
- b) 2 pictures.
- c) ½ pictures.

18. Suppose that electricity can be produced either by burning coal or by combining labor with power generators. In particular, the marginal product of coal in electricity production is constant and equals 250 kWh per ton of coal while 100 labor hours always generate 10 kWh. The technical rate of substitution of labor for coal, $TRS_{L,C}$ [labor hours/ton of coal], is given by:

- a) 25.
- b) 2500.
- c) depends on the given input mix of coal and labor.

19. Joey can substitute away six hours of manual washing by two washing machine hours while maintaining the same number of cleaned shirts. A labor hour is priced at $10. What is the price of a washing machine hour that makes Joey indifferent between every input mix?

- a) $30
- b) $3
- c) $60

20. If average cost increases as more output is produced, then

- a) marginal costs are smaller than variable costs.
- b) average costs are smaller than marginal costs.
- c) average costs equal marginal costs.

21. From the cost function $C(Q) = 30 + 20Q$ it can be inferred that average costs are

- a) U-shaped.
- b) constant.
- c) strictly decreasing.

22. The following figure depicts an isoquant and an isocost line of a firm that uses steel and aluminium in its production process of auto parts. Input mix A can be the choice of a cost-minimizing firm if
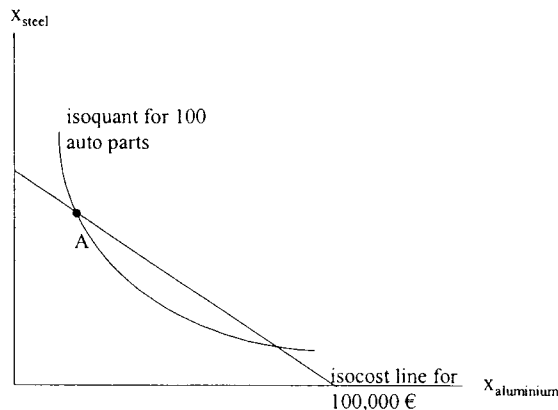
- a) the price of aluminium increases ceteris paribus.
- b) the price of steel increases ceteris paribus.
- c) the prices of steel and aluminium remain unchanged.

23. Firm X produces 1,000,000 units per year of some widget at a total cost of 15,000,000€. It is known that its production technology is characterized by increasing returns to scale. The firm hired consultant Norbert to forecast how its average cost changes as it expands its yearly production volume by 20%. Since his microeconomic knowledge is a bit dated, he asks three colleagues for advice and receives a variety of suggestions. Mark the correct one:

- a) A: "Average cost will remain constant at 15€."
- b) B: "Average cost will increase to some level above 15€."
- c) C: "Average cost will decrease to some level below 15€."

24. The next table reports market shares in the German shaving business in 2003.

Firm	Gillette	Wilkinson Sword	Others
Market share	50.1%	42.5%	7.4%

The Herfindahl-Hirschman-Index for this market must be

- a) between 4204 and 4260 (including 4204 and excluding 4260).
- b) between 4260 and 4316 (including 4260 and excluding 4316).
- c) between 4316 and 4373 (including 4316 and excluding 4373).

25. Monopolist M supplies 250 units, each priced at 18€ in a market with a downward-sloped demand curve. If the monopolist expands its supply by one unit, then the resulting change in revenue is

- a) larger than 18€.
- b) smaller than 18€.
- c) equal to 18€.

26. In the bankrupt city of Berlin, the city's senate decides to sell some of its museums' fine art. The sale of a Stradivarius involved four interested buyers whose valuations are given below. The city sold the Stradivarius using a second-price sealed-bid auction without minimum bid. The following table summarizes the valuation of potential buyers. Suppose each potential buyer bids for the Stradivarius according to the auction design's equilibrium bidding strategy.

buyer	A	B	C	D
valuation	300,000 €	200,000 €	250,000 €	800,000 €

Mark the correct statement:

- a) The Stradivarius goes to bidder D for 600,000 €.
- b) The Stradivarius goes to bidder D for 800,000 €.
- c) The Stradivarius goes to bidder D for 300,000 €.

27. Suppose that an oil field is auctioned off using a first-price sealed-bid auction (FPSB) where its value is equal for every buyer but unknown. However, each buyer holds a privately known estimate of the oil field's value. In this setting,

- a) any bid lower than a buyer's value estimate avoids the winner's curse.
- b) rational bidders should bid according to the bidding strategy for a FPSB auction with independent private values (IPV).
- c) in equilibrium, the winner's value estimate can exceed the actual value of the oil field.

28. Consider a cost-minimizing firm that is described by a production function with two inputs where both inputs are substitutes. As a cost-minimizing response to a 20%-increase in the price of input 2, the firm that wants to leave its output unchanged should

- a) increase its use of input 1 and decrease its use of input 2.
- b) not change its use of inputs 1 and 2 if that was minimizing costs before.
- c) change its input mix in a way that is impossible to predict without additional information

29. A monopolist with the cost function $C(Q) = 60Q$ faces the inverse demand curve $P(Q) = 300 - 2Q$. If the firm wants to maximize its profits, then it should charge a unit price of

- a) 60 €.
- b) 120 €.
- c) 180 €.

30. Consider again the monopolistic setting as outlined in the preceding problem. If the firm implements its profit-maximizing choice then the resulting deadweight loss is equal to

- a) 3600 €.
- b) 1800 €.
- c) an amount different from 1800€ and 3600 €.

31. Consider the following strategic form in detail:

Player 2

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

Utility of Player 2

Utility of Player 1

Mark the correct statement:

- a) There exists no Nash-equilibrium (in pure strategies).
- b) There exists a unique Nash-equilibrium (in pure strategies).
- c) There exist two Nash-equilibria (in pure strategies).

32. In the Prisoner's dilemma, there exists

- a) a Nash equilibrium which is no dominant strategy equilibrium.
- b) a Nash equilibrium that is a dominant strategy equilibrium, too.
- c) a dominant strategy equilibrium which is no Nash equilibrium.

33. There are two large firms without capacity constraints in the market for diving eyeglasses in Atlantis. Since eyeglasses are expensive, most citizens dive without them and, as a result, the public health cost from treating eye afflictions is very large. If the government approves another firm to enter the eyeglass market, then it is most likely that

- a) the public health cost due to eye afflictions decreases since the number of eyeglasses produced and sold by the industry is likely to increase.
- b) the market entry of the firm does not influence the public health cost due to stable eyeglass prices equaling marginal costs.
- c) the response of the public health cost can only be uncovered if it is known whether firms set prices or quantities.

34. Consider the Cournot model with two firms where firm 1's profit maximizing supply decision depends on the output supplied by firm 2 and vice versa. In particular, assume that the problem of profit maximization is solved and that the resulting optimal response functions are given by
$q_1^o = 75 - 0.5q_2$ and $q_2^o = 50 - 0.5\, q_1$
(The difference in intercepts stems from differences in marginal cost functions.)
Mark the correct statement.

- [ ] a) There is a dominant strategy equilibrium such that firm 1 supplies 200/3 and firm 2 supplies 50/3.
- [ ] b) There is a Nash equilibrium (but not in dominant strategies) such that firm 1 supplies 200/3 and firm 2 supplies 50/3.
- [ ] c) There is no Nash equilibrium such that firm 1 supplies 200/3 and firm 2 supplies 50/3.

35. Consider some industry with a single supplier that sets a price which is the same for all buyers. Suppose that a second supplier enters the market.
Mark the correct statement:

- [ ] a) The welfare loss in the industry is always reduced to zero if the resulting duopoly operates under Cournot competition.
- [ ] b) The welfare loss in the industry is always reduced but not completely eliminated if the resulting duopoly operates under Cournot competition.
- [ ] c) There is never any welfare loss with a single supplier.

36. A key feature of monopolistic competition is

- [ ] a) the efficiency of the long-run equilibrium since firms make zero-profits.
- [ ] b) product differentiation leading to market power.
- [ ] c) the absence of market power.

37. Consider the next figure that illustrates a representative firm's cost structure and its inverse demand curve under monopolistic competition.
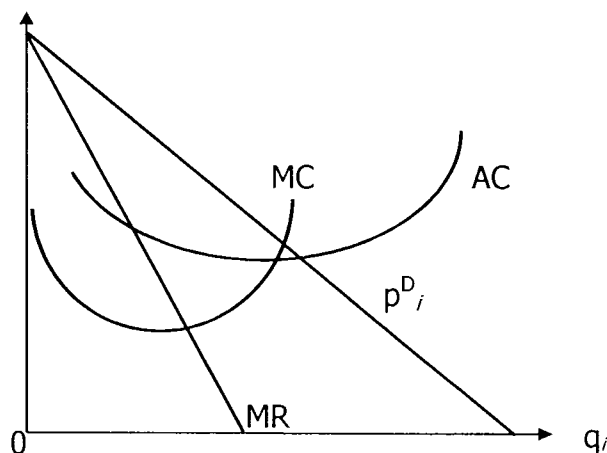
According to the figure, the industry is

- [ ] a) in its long-run equilibrium.
- [ ] b) not in a long-run equilibrium since new firms have a large incentive to enter the industry
- [ ] c) not in a long-run equilibrium since some firms in the industry are likely to exit due to large negative profits.

38. The firm Webdesign.biz produces websites and is a price-taker. The following information about the company's cost structure is available: $MC(q) = 100q$, $AVC(q) = 50q$, $AC(q) = 300/q + 50q$. The going market price is $P = 2000$. Which level of website production, q^{SR}, maximizes Webdesign.biz' profit in the short run?

- a) $q^{SR} = 0$.
- b) $q^{SR} = 5$.
- c) $q^{SR} = 20$.

39. Consider the utility function $U(x_1,x_2,x_3) = x_1 + x_2 + x_3$ and consumption bundles $A = (4,2,2)$ and $B = (2, 1, 8)$ where the i-th entry gives the quantity of the i-th commodity. Mark the correct statement:

- a) Both bundles lie on the same indifference curve.
- b) Bundle A lies on a higher indifference curve than bundle B.
- c) Bundle B lies on a higher indifference curve than bundle A.

40. Suppose John's preferences are described by the utility function $U(x_1,x_2) = x_1 + 2x_2$ and consider consumption bundles $A = (2,2)$ and $B = (4,2)$ where the i-th entry gives the quantity of the i-th commodity. Mark the correct statement:

- a) John likes bundle B more than he likes to have two bundles A.
- b) John likes bundle B less than he likes to have two bundles A.
- c) Comparisons of a single bundle to the doubled quantities of some other bundle in utility space are meaningless.

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5014 Introduction to Management I (WT 2004/05) – Final Exam

Examiners: Prof. Dr. Raith, Prof. Dr. Erichson, Prof. Dr. Reichling, Prof. Dr. Spengler, Prof. Dr. Burgard, Prof. Inderfurth, Prof. Luhmer, Prof. Dr. Wolff

You will have 2 hours to solve this exam and be able to make a maximum of 50 points. There are a few pieces of advice we invite you to consider

1. Use the theoretical tools and terminology you have learned in class and from the textbook
2. Make sure there is a clear structure in your argument (Use some time to sort your ideas before you start writing the version you want to submit.)
3. Use the time you have? If you are ready much earlier than we planned you should wonder if you forgot something
4. Remember: people have to be able to decipher what you write.
5. Leave a margin for our comments, so we can give you a more detailed feedback than just the number of points

The following aids can be used: non-programmable calculator

Please solve four (4) and only four (4) of the following six (6) questions (maximum of 12.5 points per question).

Examination questions:

Question 1: Terminology
Define the following terms. Feel free to illustrate your definitions by examples
a) Returns to a factor
b) Personal assignment
c) Recruiting potential
d) Hidden characteristics
e) Bounded rationality

Question 2: Marketing
Part 1 Explain the following terms:
a) Market potential
b) Sales volume
c) Market mix

Part 2. Profit maximization
Company XYZ faces the demand for its product that can be described as $Q = 100 - 4P + 0.005\,I$, P is the unit price for the product, and I is the average annual income of the customers. The fixed production cost is 3000 €, whereas the variable cost is 2.5 € per unit. Given the average annual income is 20,000€, answer the following questions

a) At what price and quantity is XYZ's total revenue maximized? Show the calculation.
b) At what price and quantity is XYZ's total profit maximized? Show the calculation.

Question 3: Finance
Mitch can choose to sell umbrellas, ice cream, or hot dogs in the city park. The daily revenue depends on the weather as follows:

	Rain	No rain
Umbrella	€ 250	0
Ice cream	0	€ 200
Hot dog	€ 150	€ 100

The weather report forecasts that with 40% of the chance, it will rain tomorrow. Assume Mitch can carry out only one business on a certain day.

a) Which business(es) gives(s) the highest expected revenue? Support your argument with the calculation
b) Which business is the most risky? Support your argument with the calculation
c) Mitch is risk averse. Which business will he choose? Explain

Question 4: Forms of Incorporation
What are the major advantages and disadvantages of a limited partnership in comparison with a company with limited liability from the partners' point of view?

Question 5: Production and Cost
Part 1. "Minimum unit cost" heuristics
TopoLogi AG is a consulting company. At the moment Topologi has three offices located in Berlin, Hamburg and Munich. It employs 28 consultants, who need to work at four clients in Dresden, Kiel, Leipzig and Stuttgart. The number of consultants needed at each client and the kilometer distance between the cities are shown in the tableau below. Your task is to determine how the consultants should be allocated to the clients so that the total number of kilometers traveled can be minimum. Assume that all consultants are equally qualified to work for any of the clients.
Reproduce the tableau on your answer sheet, show the allocation, and calculate the total kilometers traveled as a result of the allocation.

Offices \ Clients	Dresden	Kiel	Leipzig	Stuttgart	Consultants avail
Berlin	210	370	180	625	12
Hamburg	480	100	390	700	6
Munich	500	875	425	220	10
Consultants needed	8	4	7	9	28

Part 2. Using graphs and words, illustrate the difference between economies of scale and learning effect

Question 6: Operational Financial Plan
Part 1. Flexible budgets
The master budget of a sales department assigns 2000 visits to customers for a specific month and allows for costs of €240,000. 60% of which are considered to vary proportional to the number of visits. The actual number of visits was 2,050 and actual cost was €246,000. Please calculate
a) the flexible cost budget for the actual number of visits
b) the efficiency variance. Is it favorable or unfavorable variance?

Part 2. Inventory planning
Finished goods inventory at Jul. 1st, 2004 was 1000 units with value $9000. The costs during the third quarter of 2004 to produce 2000 units were as follows:

Direct material cost	€ 8000
Direct labor cost	€ 7000
Variable production overhead	€ 4500

2500 units were sold during the third quarter. Production volume of the fourth quarter was 1500 units. with the following costs:

Direct material cost	€ 6000
Direct labor cost	€ 6500
Variable production overhead	€ 2500

1200 units were sold during the fourth quarter
Using the weighted average method of inventory valuation, please calculate
a) the cost of goods sold in the third quarter
b) the value of the ending inventory at the end of the fourth quarter

Good Luck!