Business Decision Making **Winter semester 2011/12**
(20115) **01. February 2012**

Name: . . . . . .

Student identification number: . . . . . .

Group C

This exam consists of this answer sheet and eight questions on the following pages. It is not allowed to open the binding. Please do not forget to enter your name and student identification number above.

For each of the eight questions you can choose between four different answers, of which only one is correct. Please note that a correctly answered question will be valued higher than an unanswered question, but that an unanswered question will be valued higher than an incorrectly answered question.

Only the answer box below is used as the basis for grading. The numbered columns in the answer box correspond to the numbered exam questions. Each row, characterized by letters A-D, represents an alternative answer to the respective exam question. Please mark your answers carefully by completely filling in the corresponding circle. If no circle is marked, the question will be considered as unanswered. If more than one circle is marked, the answer will be considered as incorrect. If corrections are necessary, please indicate them clearly on this answer sheet.

Admitted Aids: Non-programmable pocket calculator;
dictionary without handwritten notes.

Answer box								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
A	O	O	O	O	O	O	O	O
B	O	O	O	O	O	O	O	O
C	O	O	O	O	O	O	O	O
D	O	O	O	O	O	O	O	O

Question 1:

Consider the following four lotteries:
A = {(100, 0.25), (110, 0.5), (120, 0.25)}
B = {(90, 0.25), (100, 0.5), (120, 0.25)}
C = {(100, 0.25), (110, 0.5), (100, 0.25)}
D = {(90, 0.25), (120, 0.5), (110, 0.25)}
A decision maker is known to hold the following indifferences with the reference lotteries

$100 \sim \{(120, 0.5), (90, 0.5)\}$

$110 \sim \{(120, 0.8), (90, 0.2)\}$

With this information, which of the four lotteries should the decision maker choose in order to maximize expected utility?

a) A
b) B
c) C
d) D

Question 2:

A team of scientists is due to spend six months in Antarctica carrying out research. One major piece of equipment they will be taking is subject to breakdowns caused by the sudden failure of a particular component. Because a failed component cannot be repaired, the team intends to carry a stock of spare units of the component, but it will cost them roughly $3000 for each spare unit they take with them. However, if the equipment breaks down and a spare is not available, a new unit will have to be specially flown in, and the team will incur a total cost of $4000 for each unit that is delivered in this way. An engineer who will be travelling with the team is certain that the number of spares required will not exceed three.
How many extra-spares should the team carry with them if their objective is to minimize costs and they decide according to the Hurwicz rule with $\lambda = 0.5$?

a) 0
b) 1
c) 2
d) 3

Question 3:

Imagine that you are the candidate in a game show with five rounds of statements, to which you must respond only 'true' or 'false'. If your response is incorrect, you end the game with nothing. However, if your response is correct, you can leave with $5 000 after the first round, $15 000 after the second, $40 000 after the third, $75 000 after the fourth, or $100 000 if you respond correctly to the fifth statement. After each correct response you must choose whether you wish to take the money or invest it in the next round. Since you do not know the next statement beforehand, you consider guessing in the next round, so that your chance of a correct response is 50%. Assuming that you are risk neutral, after which statement should you leave the game?

a) After the 2nd
b) After the 3rd
c) After the 4th
d) After the 5th

Question 4:

A risk-neutral company is considering the introduction of a new product to the market. Experience tells that there are three possible demand scenarios with differing probabilities: there is a 10% chance that the company will sell 2 000 000 units, a 40% chance that it will sell 1 000 000 units, and a 50% chance that it will sell only 200 000 units. If the company enters production, then the marginal contribution of each unit (price minus unit variable costs) would be 5 €. Producing the new product would also involve fixed costs of 4 000 000 €. As an alternative to introducing the new product, the firm could continue with its standard product, which would yield a guaranteed profit of 500 000 €. Assume that the company has the possibility of purchasing a market analysis before making its investment decision. Assume further that the market analysis would provide enough information for the company to assess precisely the market demand for the new product.
What is the maximum price that the company would be willing to pay for the market analysis?

a) € 750 000
b) € 550 000
c) € 500 000
d) € 200 000

Question 5:

Sonja and Boris have to divide five items amongst each other. The subjective valuations of all items by both children and the percentage shares of the complete estate are:

		Sonja		Boris	
	Item	%	€	€	%
1	Bicycle	38	2000	600	13
2	Piano	6	300	2000	44
3	Toolbox	12	600	400	8
4	Computer	38	2000	1000	22
5	Stamps	6	300	600	13
	Sum	100	5200	4600	100

Suppose that Sonja and Boris agree on applying the procedure "Divide and Choose". If Sonja is in the role of the Divider, what is her maximum willingness to pay for perfect information on Boris preferences?

a) € 0
b) € 400
c) € 1600
d) € 2000

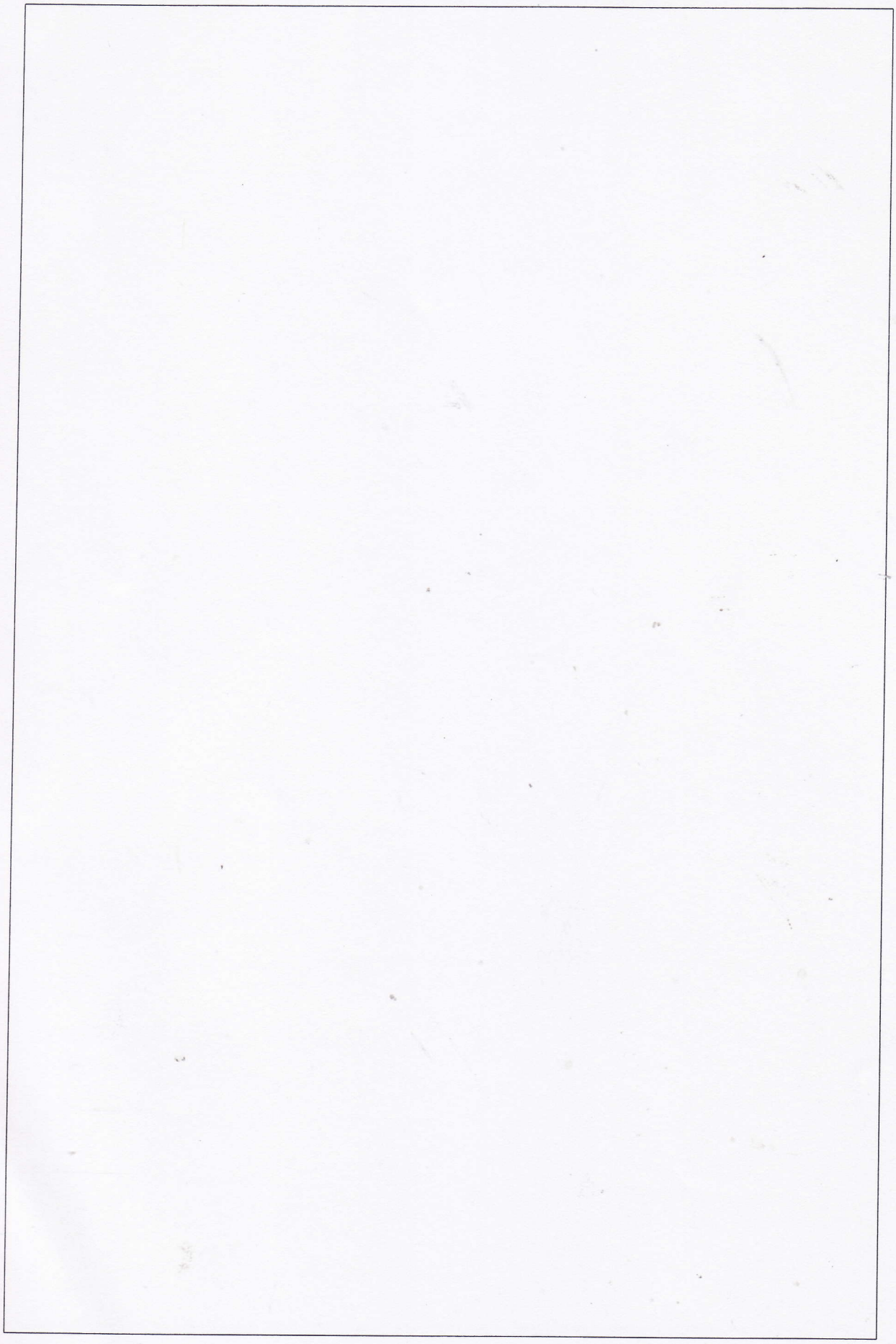
Question 6:

For the decision concerning the place to build a chain store, a company only takes Cologne, Halle, Munich and Bremen into consideration. In addition to the costs the company considers the proximity to headquarter, the institutional support and the quality of the infrastructure to be relevant for the decision. They find the proximity to headquarter three times as important as the institutional support and 1.5 times as important as quality of the infrastructure. The following table contains the company`s evaluation of all alternatives in all criteria with the best alternative receiving 100 points and the worst 0:

	proximity	support	infrastructure	costs in €
Cologne	100	50	20	8.000
Halle	60	60	0	1.000
Munich	30	0	90	3.000
Bremen	0	100	100	5.000

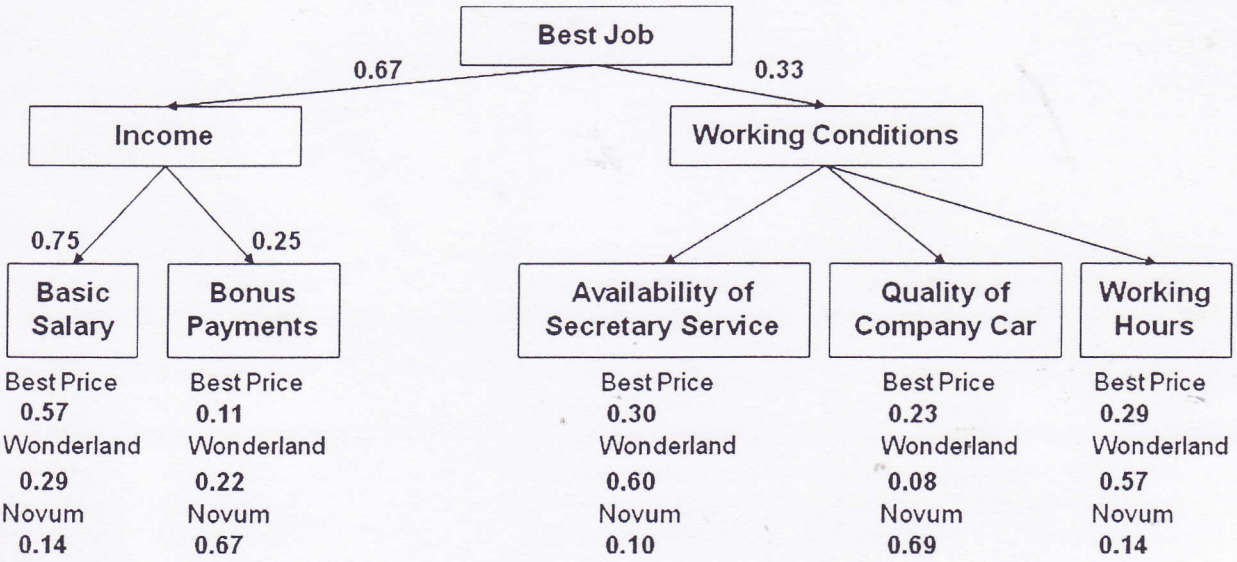
Which cities can be eliminated if we apply the SMART method (assume preferential independence between all attributes)?

a) none
b) Halle
c) Munich
d) Bremen & Munich



Question 7:

In order to find the best job you have to compare the alternatives Best Price, Wonderland and Novum with the help of the Analytical Hierarchy Process. Your problem is characterized by the following hierarchy, where the values below the alternatives describe their performances in lowest-level sub-criteria and all other values represent relative weights of sub-criteria.



Given the following matrix of pairwise comparisons between the three sub-criteria of "Working conditions", which is the best alternative?

Working Conditions	Availability of Secretary Service	Quality of Company Car	Working Hours
Availability of Secretary Service	1	0.5	0.25
Quality of Company Car	2	1	0.5
Working Hours	4	2	1

a) Wonderland
b) Novum
c) Best Price
d) You are indifferent between Novum and Best Price

Question 8:

An individual has the choice between receiving a sure payment of \$105 and investing \$100 in order to play one of two gambles. In the first gamble he can win \$500 with a probability of 1/2 or \$100 with a probability of 1/2. In the second gamble he has a 50-50 chance of winning \$325 or \$136. Assuming that the individual's utility over wealth w is given by $u(w) = \sqrt{w}$, what should he choose?

a) The sure payment
b) Gamble 1
c) Gamble 2
d) Indifferent between Gamble 1 and 2