

Name:

Student identification number:

Group A

This exam consists of 13 pages with ten questions and an answer sheet. 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 ten 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. Your exam grade will be determined by the number of correct and incorrect answers in the answer box below.

Only the answer box below is used as the basis for grading. The numbered columns in the answer box on this page 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	9	10
a	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Question 1:

In choosing a table tennis club a sportsman says:

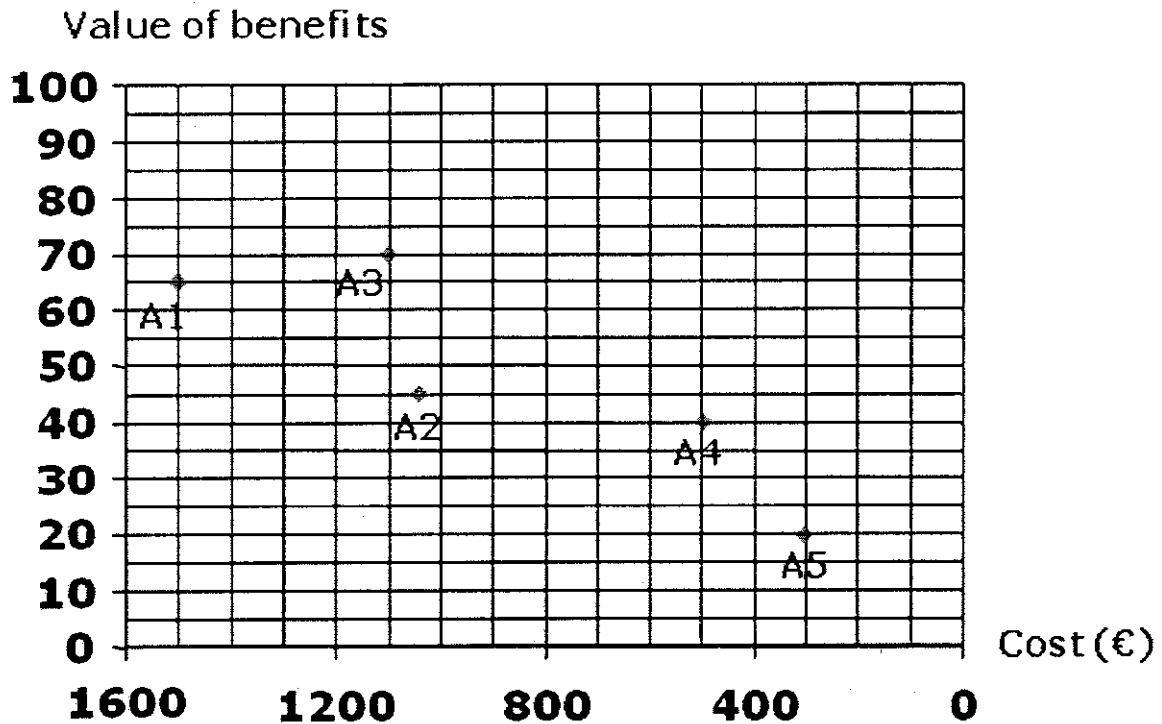
„My choice of a club depends on two criteria: maximum weekly training offered, measured in minutes, and minimum distance from home to the gym, measured in meters. I would always trade a minute additional training for 50 meters additional distance. Finally I choose the club with the best combination of training offer and distance. In case of equality I am indifferent and would let my friend decide. “

Which statement is correct?

- a) The preference statement is complete but not transitive.
- b) The preference statement is complete and transitive.
- c) The preference statement is incomplete but transitive.
- d) The preference statement is incomplete and not transitive.

Question 2:

Loki Perl has to decide on the new kindergarden for his two little girls. He evaluated all possible alternatives and applied the SMART-method to aggregate all benefit attributes. The following graph contrasts benefits and costs for the five remaining alternatives.



Which statement referring to the graphical representation is not correct?

- A5 is the optimal choice if the attribute cost is sufficiently more important to Loki than total benefits.
- There is exactly one alternative that does not survive the elimination of dominated alternatives.
- A2 will never be chosen independent of Loki's preferences.
- With a willingness to pay 20€ per benefit point Loki would be indifferent between A3 and A4.

Question 3:

Steve Appel, founder of a software company has to order notebooks for his staff. The decision, which PCs to buy, is based on the costs (in €) and should consider at the same time the criteria **Battery** endurance (in hours) and **Weight** (in gram).

The following table contains the estimated costs and the performance of each alternative in each attribute:

Notebook	Costs	Battery	Weight
PixelPeter	800	9	1,500
HaiPad	950	2	1,200
MacFlair	1,100	4	900
BitHit	1,200	10	1,700

In this decision situation Steve Appel wants to apply the method „Elimination by aspects“ (EBA). He determined the following critical values for the attributes: max. 900 €, min. 4 hours battery duration and max. weight of 1,100g.

Which of the following statements is correct?

- a) Without applying EBA it is possible to eliminate at least one dominated alternative.
- b) BitHit can be the optimal choice depending on the ordering of aspects.
- c) PixelPeter is always the optimal choice.
- d) MacFlair is the optimal choice in three out of the six possible orderings of aspects.

Question 4:

Consider the following matrix game with positive payoffs for players 1 (first value) and 2 (second value), respectively, where player 1 has the choice between strategies A, B, and C, while player 2 chooses between X, Y, and Z.

	X	Y	Z
A	3, 4	1, 2	2, 3
B	2, 0	1, 1	4, 2
C	1, 3	0, 2	3, 0

Which of the following statements is correct?

- a) There is a unique Nash-Equilibrium in pure strategies.
- b) For both players all strategies survive the elimination of strictly dominated strategies.
- c) In the mixed strategy equilibrium player 1 applies strategy B with probability $2/3$.
- d) If both players behave according to their mixed strategy equilibrium, A-X is the strategy combination with the highest joint probability.

Question 5:

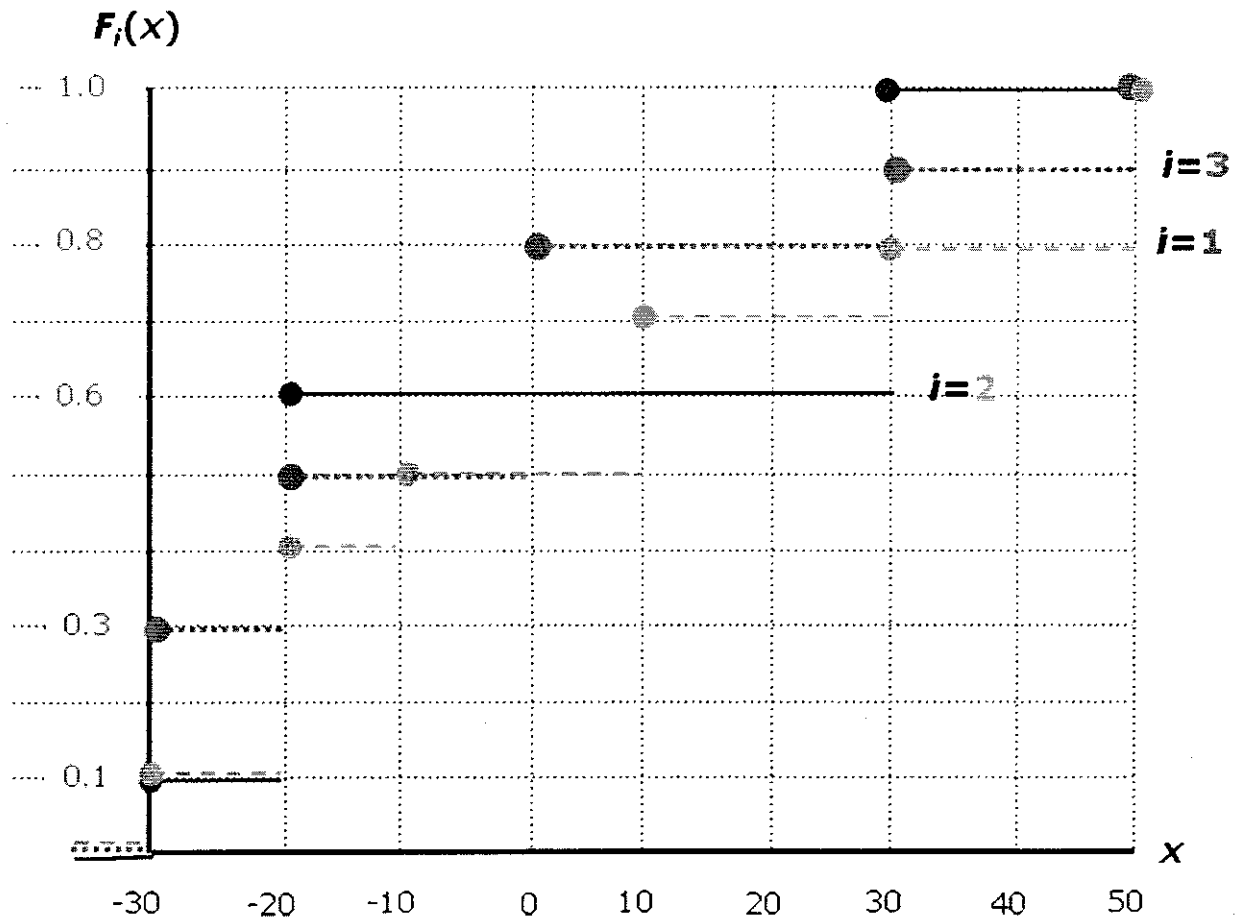
Berry Blackman is offered a lottery with the opportunity to win \$400 with a probability of p and otherwise \$100. How large is the probability p if his certainty equivalent is \$324 and his preferences are characterized by the utility function

$$u(x) = \frac{1}{x^{-0.5}} ?$$

- a) 0 %
- b) 75 %
- c) 80 %
- d) 100 %

Question 6:

Consider a decision situation under uncertainty with three different alternatives which is characterized by the following risk profiles, where the dashed line represents alternative 1, the straight line represents alternative 2 and the dotted line represents alternative 3:

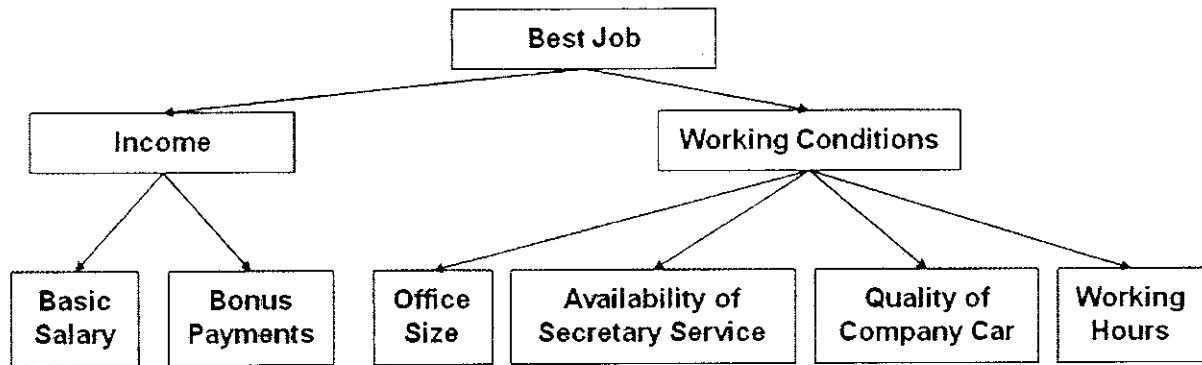


Which of the following statements is correct?

- No alternative can be eliminated by the first order stochastic dominance criterion.
- For a risk-seeking decision maker we can always determine the optimal alternative based on the second order stochastic dominance criterion.
- A risk-neutral decision maker only considers the expected value of a lottery, and therefore chooses alternative 2 (profile indicated as straight line).
- For a risk-averse decision maker alternative 1 (profile indicated as dashed line) second order stochastically dominates alternative 2 and 3.

Question 7:

In order to find the best job you have to compare all relevant alternatives with the help of the Analytical Hierarchy Process. Your problem is characterized by the following hierarchy:



In order to determine the optimal alternative you need to determine the priorities for all sets of pairwise comparisons. For the comparison of all sub-goals of criterion "working conditions" you came up with the following matrix, where two values (a,b) are still missing:

Working Conditions	Office Size	Secretary Service	Car Quality	Working Hours
Office Size	1	2	a	1/3
Secretary Service	1/2	1	b	1/6
Car Quality	1/a	1/b	1	2/3
Working Hours	3	6	3/2	1

Which of the following statements is correct?

- The matrix is of rank 2 if $a=2$ and $b=1$.
- The matrix is inconsistent independent of a and b .
- For $a=0.5$ and $b=0.25$ you receive as vector of priorities: $(\omega_1 = 0.15 ; \omega_2 = 0.08 ; \omega_3 = 0.31 ; \omega_4 = 0.46)$.
- According to the given matrix for working conditions sub-goal "Secretary Service" is twice as important as "Office Size".

Question 8:

Mike and Robert want to negotiate over the items, which are stated in the following table together with their subjective value of all items measured in €. Both agree to apply the Adjusted Winner-Procedure. What is the resulting final value (in %) both receive?

	Item	Mike	Robert
1	PC	2,100	1,200
2	Bike	2,100	1,200
3	guitar	350	900
4	Microwave	1,400	1,800
5	Washing machine	700	300
6	Diving suit	350	600
	Overall value	7,000	6,000

- a) 57 %
- b) 72 %
- c) 61 %
- d) 68 %

Question 9:

Consider the following statements concerning different rules in decision situations under uncertainty. Which of the following statements is not correct?

- a) The Hurwicz Rule only considers the worst and the best of all possible states of nature for a given alternative.
- b) The Minimax Regret Rule may depend on irrelevant alternatives.
- c) The Laplace Rule assumes an equal probability for all possible outcomes.
- d) According to Milnor (1954) there exists no rule that satisfies all of the following postulates: Completeness & Transitivity, Independence of the labeling of alternatives and states of nature, Dominance-criterion and the rank order of alternatives remains unchanged, if the values of all consequences of a given state of nature are changed by a constant value or if a new alternative that is not chosen is introduced.

Question 10:

The principal of a local college is faced with the decision on the improvement of the schoolyard with a given budget of five units and an amount of time to invest of four. Time and money could either be invested into plants (P) or to add some applications (A), where a plant always delivers three positive votes and an application four among the students. Each working hour could either be devoted to one unit of P or one unit of A. Each plant costs two units and is therefore twice as expensive as an application. The principal wants to achieve the highest possible acceptance. Which of the following statements is correct?

- a) The principal decides to add three applications and one plant.
- b) The principal will only invest into applications.
- c) In the optimum the time restriction is not binding.
- d) The maximum amount of possible votes is 12.

