

# ISM-E1004 - Business Analytics 2, Lecture, 8.1.2024-19.2.2024

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Time left 2:52:13

Question 1

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The following list contains statements that are either true or false. Which of the statements are true?  
Grading: each incorrect answer eliminates the points of one correct answer.

Select one or more:

- ☐ A certain optimisation problem has a convex objective function and its decision variables are integer valued. Such an optimisation problem is classified as a convex problem.
- ☒ The Expected Value of Sample Information cannot be larger than the Expected Value of Perfect Information.
- ☒ The Law of Total Probability relates marginal probabilities to conditional probabilities.
- ☐ Multiattribute Value Theory (MAVT) always assigns equal weigths to all attributes.
- ☐ The independence axiom of Expected Utility Theory (EUT) is based on empirical observations of how people will choose in different situations.
- ☐ If  $X$  dominates  $Y$  in the sense of First-degree Stochastic Dominance and  $Y$  dominates  $Z$  in the sense of First-degree Stochastic Dominance, then  $Z$  dominates  $X$  in the sense of First-degree Stochastic Dominance.
- ☒ The Conditional Value-at-Risk measure  $CVaR_{\alpha}[X]$  describes the expected value of random variable  $X$  on the condition that this value is lower than or equal to  $VaR_{\alpha}[X]$ .
- ☒ A decision maker with a strictly convex utility function is classified as risk-seeking in the sense of Expected Utility Theory.
- ☐ If  $X$  dominates  $Y$  in the sense of First-degree Stochastic Dominance, then the cumulative distribution function of  $X$  can be strictly above the cumulative distribution function of  $Y$  at some points.
- ☒ For a decision maker with a linear utility function, the certainty equivalent of a random variable equals the expected value of the random variable.
- ☐ The cumulative distribution function  $F_X(x)$  denotes the probability that the value of random variable  $X$  is greater than or equal to  $x$ .
- ☐ Value-at-Risk 10% for a normally distributed random variable does not depend on the mean of the random variable, only on its variance.

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