Rules for evaluation of the exam in TMA4275 Lifetime analysis May 2024

This document specifies how the solutions to the exam are evaluated. This document should be read together with the problem text and the solution sketch. The solutions are evaluated by assigning points for the answer in each item of the solution. The points for each item are added together and thereafter scaled so that the maximum possible score becomes 100 points. The number of points is thereafter converted to a letter grade according to the conversion rule specified at the end of this document.

In the following we specify rules used to assign points to each of the items in the problem text. For each item the maximum number of points possible is ten.

- 1. Four points are given for finding the survival function correctly. Two points for finding each of the two probabilities from the survival function, and two points for finding the median from the survival function.
- 2. Three points for writing down the correct estimated relative risk function. Three points for finding the 95% confidence interval. Four points for a good discussion of what to do next. To get full score on the what to do next question, one must both discuss to remove covariates and model check.
- 3a) Five points for writing up a correct likelihood function as a function of α , β and γ , including defining a reasonable notation. Five points for finding the log likelihood function, including defining the statistics s_0 , s_1 , s_2 and s_4 correctly.
- 3b) Three points for finding the three partial derivatives correctly. Four points for optimising analytically with respect to α and β and finding a correct expression for the profile log-likelihood for γ as a function of γ . Three points for optimising analytically also with respect to γ .
- 4a) Four points for using correctly the Doob-Meyer decomposition of N(t) to find the given expression. Four points for finding a correct expression for $E[Z(t_0)]$ (only two points if only finding the expression for $Z(t_0)$ when H_0 is true). Two points for explaining why $E[Z(t_0)] = 0$ when H_0 is true.
- 4b) Four points for finding the predictable variation function for $Z(t_0)$. Four points for finding the unbiased estimator for the variance of $Z(t_0)$. Two points for explaining how to decide when to reject H_0 .
- 5a) Four point for correctly identifying $\widehat{A}_{01}(t)$ as a step function with steps at the correct values of t. Four points for finding the correct jump sizes. Two points for the plot.
- 5b) Four points for identifying the correct number of factors, four points for identifying the correct $\Delta \hat{A}(t)$ matrices, and two points for multiplying correctly. Subtract two points if ending up with a matrix that is not a transition matrix without commenting this.

The aggregated and scaled number of points is converted to a letter grade according to the following table.

Points	Letter grade
(88, 100]	А
(76, 88]	В
(64, 76]	С
(52, 64]	D
(40, 52]	${ m E}$
[0, 40]	\mathbf{F}