

**EXAMINERS' REPORT**

**Subject CA2 -  
Model Documentation, Analysis and Reporting**

**Examination assignment CR01**

**Introduction**

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The specimen solutions are based on one possible approach to modelling the assignment set but the examiners gave credit for any alternative approach or interpretation which they considered to be reasonable.

T.J. Birse  
Chairman of the Board of Examiners

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A possible model with audit trail and a possible summary are posted on the website. These are not intended to be model solutions but are intended to include more detail than would ordinarily be possible within the time allowed within the examination. There were many marks available in the audit trail and summary for the explanations, observations, conclusions and suggestions on the model itself. In practice, a wide number of solutions was acceptable and candidates would have achieved good pass standards without having the same level of detail as the specimen solutions.

Candidates were required to produce a simple multi-state model of the mortality of a cat over its nine lives and use this to ascertain whether the client's available funds are sufficient to pay for cat food over the cat's entire lifetime of 9 lives. While the model contained a number of possible states, transitions could occur in only one direction, making it little different from the Healthy-Sick-Dead model contained in the Core Technical exams. Candidates were not expected to allow for multiple transitions within the same period.

Many candidates lost sight of the true purpose of the model which was to help determine whether the client can afford to feed the cat. In trying to give an overview of the work carried out, those candidates did not realise that the multi-state model was the means and not the objective of the exercise.

A life table was supplied as data and most candidates carried out some checks to assess whether the life table was fit for purpose. Very few candidates challenged the assertion that a cat has 9 lives – a key assumption governing the final result.

A number of assumptions were necessary before the model could be designed and built. Candidates did not give their assumptions in either the audit trail or summary. In particular, key assumptions were often not stated; examples include the timing of the cashflows and the assumption that a cat can pass through only one life in each projection period.

The construction of the multi-state model was often poorly handled. Candidates managed to calculate the life table for the first life but many struggled to build a life table for the later lives. The simple nature of the multi-state model meant that the number entering a life after the first was merely the number dying in the previous life in the previous time period. Few candidates were able to describe these calculations appropriately in either the audit trail or summary. Given the target audience for each document, a concise technical description could be used rather than the lengthy discursive approach adopted in a number of cases. Mathematical formulae are acceptable and, provided the notation used is properly defined, can be used to convey the appropriate message.

In the second scenario postulated by Dr Thomas, candidates had to adjust the mortality rates in each life after the first. This was often badly handled. Candidates failed to carry out some simple checks to see whether the results were reasonable: in some cases the probability that the cat was alive was greater than 1 or the formulae used did not reproduce the original answer if the parameters were reset to reflect the original scenario. In particular, few candidates commented on whether the increase in the present value of feeding costs would be a reasonable result given the reduction in the mortality rates.

The second scenario produces an answer that means that the initial cash lump sum would not cover the present value of the feeding costs. Candidates were then required to determine the number of tins of cat food that the lump sum available would purchase. Some candidates neglected to do this or, having calculated the required number, to comment on the result in their summaries. Too many

candidates reached for the Excel goalseek functionality to determine the answer without realising this was unnecessary since the required equation was linear in the variable being sought. This suggests that candidates were not analysing the problem sufficiently or planning properly.

The additional information required the modelling of a change in the cat's appetite in each life after the first. This was badly handled, when it was attempted at all. Many candidates made further amendments to the mortality rates rather than amending the number of tins of cat food consumed in each life. Again, this suggests that candidates were not analysing the problem sufficiently or not even reading the question properly.

Given two alternative scenarios, many candidates did not say why these alternatives were being considered in either the audit trail and summary. Proper documentation of the work carried out should include an explanation of why it is being performed rather than leaving the reader to guess.

This assignment gave a lot of scope for suggested next steps. However, many candidates made only a token effort on this part. There were many aspects of the information provided and the required model that could be investigated further. Many marks were lost by not thinking about the information given and how or where it could be challenged.