INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

X18

Subject CA1 – Actuarial Risk Management

Paper Two

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*

2. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*

3. *You have 15 minutes of planning and reading time before the start of this examination. You may make separate notes or write on the exam paper but not in your answer booklet. Calculators are not to be used during the reading time. You will then have three hours to complete the paper.*

4. *Mark allocations are shown in brackets.*

5. *Attempt all seven questions, beginning your answer to each question on a new page.*

6. *Candidates should show calculations where this is appropriate.*

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.

1 (i) Describe the two conflicting objectives investment managers will often face when managing an investment fund. [3]

(ii) Explain how an appropriate investment policy can be established for the management of an asset portfolio. [4]
[Total 7]

2 (i) Describe why providers of financial products should hold capital. [4]

(ii) Outline two approaches to regulation to calculate the adequacy of capital to be held for a financial provider. [4]
[Total 8]

3 An insurance company has sold with profits savings policies to retail customers for many years. Following customer complaints, the regulator has now requested that the company reviews the environment under which these policies were sold, as it is concerned that customers may have been disadvantaged.

(i) Outline the information that customers may have relied upon at the point of sale. [4]

(ii) Discuss why the regulator may agree that customers have been disadvantaged. [5]
[Total 9]

4 (i) Outline the key steps in using membership data to carry out an analysis of experience of mortality in a pension scheme. [6]

(ii) Discuss the appropriateness of using the results from such an analysis for a scheme with 100 members, for using in a valuation. [4]

(iii) Outline what adjustments need to be made in light of this. [2]
[Total 12]

5 A financial institution wants to set up a new savings product for the retail market. Individuals will be able to invest a lump sum when they join and will only be able to withdraw it at the end of 10 years, tax-free. The individuals can choose to invest the lump sum in one or more of the following funds:

- A – an index-tracking fund, following the performance of the top 100 companies in the country;
- B – a hedge fund specialising in small overseas companies;
- C – a fund in index-linked government bonds.

(i) Describe the characteristics of each of the funds. [6]

(ii) Suggest the types of individuals that the institution could target this product at. [2]

(iii) Suggest why each of the funds might be suitable for the individual investors identified in part (ii). [6]

To boost sales, the marketing director has suggested offering a 'Value for Money' guarantee, where the final payment the policyholder will receive at the end of ten years is at least equal to the lump sum initially invested.

(iv) Discuss the risks the financial institution might face in offering this guarantee. [5]

[Total 19]

6 (i) Set out the steps involved in stochastic modelling. [7]

An insurance company is developing a stochastic economic capital model. The model will be used to measure the risk in a portfolio of corporate bonds. The risk will be modelled by simulating credit spreads (the difference in yield between bonds of different credit ratings) and credit rating transitions (the move from one rating to another of a specific bond). The insurer has obtained the following data to use for the calibration of the model:

- Credit spreads: Money weighted credit spreads for corporate bond indices since 2000 split by credit rating.
- Credit rating transitions: Issuer weighted credit rating transitions since 1970 split by credit rating.

(ii) Explain why there is a correlation between credit spreads and credit transitions. [4]

(iii) Discuss the issues in using this data in setting those correlations. [6]

(iv) Discuss alternative approaches to set the correlation between credit spreads and credit transitions. [2]

[Total 19]

7 An insurance company writes immediate annuities.

(i) Discuss how a portfolio of assets could be constructed to match the insurance company's liabilities. [6]

(ii) Outline why exact matching is likely to be difficult to achieve. [3]

(iii) Explain why matching is likely to be more difficult to achieve for annuities with high escalation rates compared with level annuities. [2]

The company is considering adopting an unmatched investment strategy for its immediate annuity business.

(iv) Discuss the factors that the company should consider before deciding to adopt an unmatched strategy. [7]

The company decides to adopt an unmatched strategy. Investment managers will be expected to follow an active investment strategy which will be monitored relative to specified benchmarks.

(v) List reasons why the actual investment returns achieved by the investment managers could be different from the benchmark returns. [4]

An external investment management company is to be chosen to manage the unmatched strategy. Prior to concluding a contract with this investment management company, the insurance company needs to complete a due diligence exercise.

(vi) Outline the features of the investment management company's practices and procedures which the insurance company should consider as part of this assessment. [4]

[Total 26]

END OF PAPER