

# INSTITUTE AND FACULTY OF ACTUARIES

## EXAMINATION

24 September 2012 (am)

### Subject CA1 – Actuarial Risk Management

#### Paper One

*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 have 15 minutes before the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*
3. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all seven questions, beginning your answer to each question on a separate sheet.*
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** A country is hosting a major international sporting event. The opening ceremony for the event will be preceded by a procession involving celebrities and a torch-bearing relay through a large number of cities of the country.

Describe the risk management process that the country should follow when preparing for the procession. [8]

- 2** A large defined benefit pension scheme has made a significant profit from selling fine art assets that were part of its investment portfolio and now has a substantial surplus.

(i) Outline the options available for using this surplus. [3]

(ii) Discuss the factors that will influence how and when the surplus is used by the scheme. [6]

[Total 9]

- 3** A subsidiary of a multinational general insurance group is planning on launching a new car insurance product covering accident risks (i.e. not theft risk). This subsidiary writes business in only one small country and has no experience of writing car insurance risks.

The subsidiary has decided to use combined data from other companies in the multinational group to set the assumptions used to calculate premiums.

(i) Describe how useful this data would be in determining these premium rate assumptions. [4]

The government of the subsidiary's country has banned the use of both age and gender as rating factors for all general insurance products.

(ii) Discuss other rating factors that could be used to ensure that premiums charged by the subsidiary accurately reflect the risks associated with each policyholder. [7]

[Total 11]

- 4** A life insurance company specialises in selling term assurance policies to individuals over the age of 50.

(i) List the types of information that would be asked for on the application form for this product. [4]

(ii) Describe how underwriting and other control systems could be used to manage the risks the company faces in writing these policies. [9]

[Total 13]

- 5** (i) Describe the principal differences between the nature of the benefits payable under the following types of insurance contract:
- conventional with profit
  - conventional without profit
  - unit-linked
- [5]

An insurance company offers a regular premium unit-linked endowment assurance policy. On death before the end of the term, the policy pays the minimum of a guaranteed fixed cash sum.

- (ii) Explain why the reserves required would be higher compared with a similar policy that does not have the guaranteed death benefit. [3]
- (iii) Discuss factors that could influence the level of the additional reserves required. [5]
- (iv) Set out the most appropriate approach to calculating the level of the additional reserves required. [3]
- [Total 16]

- 6** A professional sports club that is currently leasing its stadium, is looking to move to a new larger stadium that it will develop and own. It needs to raise finance in order to fund the development.

- (i) Describe the features of the types of investment assets that the club could issue or use to raise the necessary finance. [7]
- (ii) Discuss the factors an investor would consider when providing such finance. [6]

A wealthy individual based in an overseas country has decided to buy the sports club and fund the development of the stadium. The individual will sell all his existing property company shares and use the proceeds to fund the new stadium.

- (iii) Outline the different investment characteristics of a portfolio of property company shares compared to the new sports stadium. [4]
- (iv) Discuss other practical issues involved in the ownership of an overseas investment [4]
- [Total 21]

- 7 A new financial institution believes that it has spotted an opportunity to offer a new type of loan product. In general, loans will be for relatively low amounts and be over very short terms. However, the annualised interest rates charged on the loans will be extremely high.

Customers will select the amount they wish to borrow. They will then select a repayment date and the total amount to be repaid will be calculated. The quotation system will be flexible enabling customers to easily and quickly consider a range of borrowing and repayment options. Customers will earn trust points based on repayment history, which gives them access to higher loans and lower interest rates.

The principal features will be:

- (a) Maximum loan term 40 days.
  - (b) Maximum loan for new customers \$500 and \$1,500 for “trusted” customers.
  - (c) Typical annual equivalent interest rate 4000%.
  - (d) Product offered via the internet only.
  - (e) Repayment in full by a single payment on the due date.
  - (f) Repayment directly from borrower’s bank account using details submitted on application.
  - (g) Option to repay early (with a lower amount) with no fee.
  - (h) Provided all interest and fees are paid by the due date, option to extend the loan for up to a further 30 days.
  - (i) Extended loans will be subject to penalty fees and a higher interest rate.
  - (j) All interest payments, fees and charges to be clearly shown on the quotation page (including when altering terms as above). No other charges are payable.
  - (k) Decision on a loan given within 15 minutes of submitting a request.
  - (l) On application, customers must supply an e-mail address and a mobile telephone number.
  - (m) Customers must also declare employment status and level and frequency of income.
  - (n) Apart from personal details, no other information is required.
  - (o) Quotation page explains the risks involved to customers, how the lender will try to address these risks and highlights circumstances where a request for a loan may be refused.
- (i) Describe the characteristics of the likely target market for these loans. [3]
- (ii) Explain how each of the specific features listed above could mitigate the main risk to the lender that it is designed to deal with. [15]

As part of the application process, the lender is considering asking potential borrowers for proof of income and employment status.

- (iii) Discuss the advantages and disadvantages to the lender of asking for such proof. [4]
- [Total 22]

**END OF PAPER**