

# EXAMINATION

11 April 2007 (pm)

## Subject CA1 — Core Applications Concepts

### Paper 2

*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 at 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 7 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.*

- 1** For money market instruments:
- (a) Describe the principal characteristics.
  - (b) Describe the markets and the market-makers. [4]
- 2** A company has issued a corporate bond with an option to convert it into the ordinary shares of the company.
- Describe possible methods of valuing this bond. [7]
- 3** A proprietary general insurance company writes several classes of business.
- (i) Discuss the consequences of underestimating the effect of inflation when setting the claims reserves. [5]
- A director has suggested that in order to maximise the returns to shareholders the free reserves should be invested in high growth equities. The company has a high level of free reserves.
- (ii) Discuss the suitability of the suggestion. [3]
- [Total 8]
- 4** (i) Outline the considerations that need to be taken into account when designing an insurance proposal form. [5]
- An insurance company has decided to start selling health insurance.
- (ii) List the information from the proposal form that will need to be considered when pricing such a policy. [4]
- [Total 9]

- 5** (i) List the areas where an actuary could give professional advice to a manufacturing company. [5]

A manufacturing company offers its employees a salary continuance benefit that comes into payment in the event of long-term absence through ill-health. It also sponsors a defined contribution pension plan to which the employer contributes 10% of each employee's basic salary.

The salary continuance benefit is currently insured. The main features of the benefit are:

- The benefit is payable after continuous sickness absence of 10 weeks, up until the employee's 65<sup>th</sup> birthday or earlier return to work.
- The benefit payable is 70% of the employee's basic earnings (pre-sickness), increasing annually at a fixed rate of 4% per annum.
- During payment of the benefit, the employee remains a member of the pension plan and continues to accrue benefits – the insurance meets the cost of the 10% pension contributions.

The company has asked how it could reduce the cost of the salary continuance benefit.

- (ii) Discuss the actions the company can take. [10]  
[Total 15]

- 6** An insurance company in a small developed country is pricing a range of annuity contracts for the first time. It wants to understand the mortality risk it may be exposed to.

- (i) List the types and sources of data that the insurance company could use in its investigation. [4]
- (ii) Assess the issues relating to using these data sources to determine the potential mortality risk [16]  
[Total 20]

**7** A major professional sports team is based in a stadium complex near the centre of a large provincial city. The majority of the shares in the club are under the control of one family. The shares are not quoted. An investor has been offered the chance to buy a significant block of shares.

- (i) (a) Suggest reasons why the shares may have been made available.
- (b) Give reasons why the investor may wish to invest.
- (c) Outline specific features of the club's balance sheet that the investor should consider before investing. [12]

The club currently does not provide pension benefits for any of its employees, but it is considering introducing them.

- (ii) Describe the two main types of pension benefit schemes that could be provided. [3]
- (iii) Discuss the appropriateness of each type of scheme in (ii) for the club and the different groups of people it employs. [7]

The club is reviewing its group arrangements for life assurance, long term sickness insurance, and accident insurance.

- (iv) State the general features of these markets. [3]
- (v) Discuss how the mortality and morbidity experience of the club's employees may compare to that under other group arrangements. [6]

The club has recently signed a star player from overseas, who has asked for investment advice.

- (vi) Outline the major points that would be made and the information required to carry out an appropriate assessment. [6]

[Total 37]

**END OF PAPER**