

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

20th November 2012

Subject CA1 – Actuarial Risk Management (Paper II)

Time allowed: 3 Hours (14.45* - 18.00 Hrs)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

- 1** Please read the instructions on the front page of answer booklet and instructions to examinees sent along with hall ticket carefully and follow without exception
- 2** Mark allocations are shown in brackets.
- 3** *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 3 hours to complete the paper.
- 4** You must not start writing your answers until instructed to do so by the Supervisor.
- 5** Attempt all questions, beginning your answer to each question on a separate sheet. However, answers to objective type questions could be written on the same sheet.
- 6** Please check if you have received complete Question Paper and no page is missing. If so, kindly get new set of Question Paper from the Invigilator.

AT THE END OF THE EXAMINATION

Please return your answer book and this question paper to the supervisor separately.

- Q.1)** In a country, the pensions received from defined benefit schemes are treated as taxable income, in the hands of pensioners. The Government has now introduced a regulation that allows pensioners an option to commute up to one third of their pension at the time of vesting, as non- taxable lump sum benefit.
- Outline the issues that an existing defined benefit scheme should take into account in developing the terms of commutation. [7]
- Q.2) [i]** List the main factors that an individual investor should consider when deciding on his/her investment strategy.
- A friend, aged 40 years, has approached you for advice regarding investments. He has recently received a lump sum inheritance from an aged relative. In addition, he is interested in investing the excess of his monthly salary over his expenditure. (3)
- [ii] Outline the information you would seek from your friend in order to advise him on the most suitable solution? (6) [9]
- Q.3)** The Government of a developing country is concerned about the “overall security risk” in defined benefit pension schemes. The Government suggests that the ‘security’ could be enhanced by issuing detailed disclosure of information to all members.
- [i] Explain briefly what is meant by “overall security risk” in a defined benefit scheme. (3)
- [ii] In this context, define the term "sponsor covenant". (1)
- [iii] Discuss briefly how the introduction of regulations requiring disclosure of information could increase security for members. (3)
- [iv] Suggest other methods of regulation that could be used to enhance the security for members. (4) [11]

- Q.4)** A company sells limited premium decreasing term insurance to individual customers to cover different types of loans.
- [i] Discuss briefly with reasons why the company might want to underwrite this business. (4)
- [ii] Describe the options open to the company, if the underwriting process shows an applicant to have a higher expected level of mortality risk than that assumed in the
- The company has decided to bid for a large tender floated by a private bank to offer life insurance solutions to their loan customers. The loans could be mortgage, personal or credit card loans. The benefit shall be the outstanding loan balance at the time of death of the loan customer. The Sales Director of the company is of the view that having a simplified underwriting process is necessary to win the bid. (4)
- [iii] Suggest with reasons how existing underwriting norms applicable to individual customers could be simplified for the bank loan customers. (5) **[13]**
- Q.5)** [i] What are the reasons for a life insurance company to invest in property? (3)
- [ii] Why might a life insurance company invest in leaseholds instead of freehold property?
- A medium sized life insurance company has been approached by a property development company to invest in a new residential apartment construction project he is going to commence. The property development company will finance 40% of total project cost from its internal accruals. For the balance 60% the company has put forward 2 investment proposals to the life insurance company-
- (3)
- Proposal 1- The life insurance company provides 60% finance to the project through a 5 year interest bearing unsecured loan.
 - Or alternatively,
 - Proposal 2- The life insurance company provides 60% finance to the project. In lieu of this investment, the insurance company is offered lease hold interests in 50% of the newly constructed apartment once the project is complete. The term of the lease will be 20 years.
- [iii] Discuss the factors that need be considered by the life insurance company in making its decision. (8) **[14]**

- Q.6)** [i] From a financial institution's risk management perspective how can swaps be used to manage risk? (4)
- [ii] Give one example each of
- [a] A swap of uncorrelated risks
- [b] A swap of negatively correlated risks (2)
- [iii] [a] Describe two methods of valuing swaps. (4)
- [b] A financial institution has entered into an interest rate swap with company ABC. Under the terms of the swap, it receives 11% per annum and pays 6-month LIBOR on a principal of INR 20 million for 5 years. Payments are made every 6 months. Suppose that company ABC defaults on the sixth payment date (at the end of year 3) when the interest rate (with semi-annual compounding) is 9% per annum for all maturities. What is the loss to the financial institution? Assume that 6-month LIBOR was 10% per annum halfway through the year 3. (4) **[14]**
- Q.7)** You are the Product Actuary in a general insurance company. In the last 2 years, the general economic situation in the country, the company operates in, has worsened. Given this scenario, the Marketing Head of your company has suggested that your company should introduce a "Job-loss" cover (also known as unemployment insurance). There are currently no such covers being offered in the market.
- Propose a product design for such a cover bearing in mind the various risks involved **[15]**
- Q.8)** [i] List the rating factors that need to be considered for pricing fully comprehensive private motor insurance product. (4)
- A general insurance company offering private motor insurance policy has decided to offer 10% discount in standard premium rates to policyholders who consent to always get their cars repaired in 'the general insurance company approved garages'.
- [ii] Discuss why the general insurance company would offer such a discount. (4)
- [iii] List the components of provisions that are required to be held for a motor insurance portfolio. (3)
- The company has recently conducted experience analysis of claims in their motor portfolio. It shows that the loss ratio in "motor third party insurance" has deteriorated over the last few years and the company is just able to recover its claim costs.
- [iv] Outline the reasons why it could be so and suggest steps that the management could take to control claim costs. (6) **[17]**
