Actuarial Society of India

EXAMINATIONS

24th May 2007

Subject CA1 – Liabilities and Asset-Liability Management

Paper II

Time allowed: Three Hours (14:15 - 17:30 Hrs)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. *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.*
2. *You must not start writing your answers until instructed to do so by the supervisor.*
3. *The answers are not expected to be any country or jurisdiction specific. However, if examples/illustrations are required for any answer, the country or jurisdiction from which they are drawn should be mentioned.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all questions, beginning your answer to each question on a separate sheet.*
6. *Fasten your answer sheets together in numerical order of questions. This, you may complete immediately after expiry of the examination time.*

Professional Conduct:

"It is brought to your notice that in accordance with provisions contained in the Professional Conduct Standards, If any candidate is found copying or involved in any other form of malpractice, during or in connection with the examination, Disciplinary action will be taken against the candidate which may include expulsion or suspension from the membership of ASI."

Candidates are advised that a reasonable standard of handwriting legibility is expected by the examiners and that candidates may be penalized if undue effort is required by the examiners to interpret scripts.

AT THE END OF THE EXAMINATION

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

Q.1) Describe the project management process within the context of life insurance product development. **[10]**

Q.2) An employer provides a benefit scheme for employees. The benefit scheme only provides benefits when the employee leaves the employ of the employer. Benefits are provided as lump sum cash payments (or transfer to another scheme) on resignation; or an annuity on retirement. The amount of the annuity is determined as a function of the employee's average salary over the final three years. The scheme is funded solely by regular contributions from the employer made over the lifetime of the member. In terms of the regulations, the employer is required to demonstrate the solvency of the scheme to the regulator on an annual basis. Decisions for the fund are made by a group of trustees comprised half voted by members and half nominated by the employer.

(a) List the assumptions required to form the valuation basis for the statutory valuation of the benefit scheme. (2)

Two of the stakeholders in a defined benefit pension fund arrangement are the sponsoring employer and annuitant members in the fund. The funding level of the scheme is being reviewed.

(b) Analyse the conflicting wants of these two stakeholders. (2)

(c) Discuss the characteristics of a desirable basis for annuitant members relative to a best estimate basis. (3)

(d) Describe the considerations of the trustees before accepting a weaker basis. (2)

[9]

Q.3) A life insurer offers a full range of life products including term assurances, annuities and guaranteed unit linked products.

(a) Define the term "New Business Strain" (1)

(b) Explain the difference between "moral hazard" and "anti-selection". (1)

(c) Describe the other sources of business risk that may affect this company. (10)

(d) Suggest methods to mitigate or reject these risks. (5)

[17]

Q.4) A life insurance company writes 20 year recurring premium conventional endowment business; recurring premium unit linked business and has a closed portfolio of single premium with-profit annuities.

Discuss an appropriate investment strategy for this company and the practical problems that may occur when implementing this strategy. **[16]**

Q.5)

(a) Outline the key factors affecting the choice of assumptions when setting the discontinuance benefits for individual members of an employer sponsored benefit scheme. (3)

(b) Explain how these factors affect the choice of assumptions. (6)

[9]

Q.6) A general insurance company writes personal motor business. As part of the annual valuation an analysis of surplus is conducted to reconcile projected profits produced in the business plan with the profits reported in the valuation.

(a) Give reasons why this analysis of surplus may be performed. (6)

(b) Outline how the analysis of surplus should be performed. (7)

[13]

Q.7) A small life insurance company in a newly opened insurance market is a direct writer for group term business. All classes of business are written on an annually renewable basis. All companies in the territory operate on a financial year of 1 April – 31 March.

The following obligatory reinsurance treaties exist between the direct writer and its reinsurers:

Reinsurer 1: Treaty 1: 60% quota share for sum assureds up to a maximum of Rs 50,00,000. Cover is provided on the first Rs 50,00,000 sum assured for all cases (irrespective of sum assured).
Reinsurer 2: Treaty 2: Risk XL Reinsurance of Rs 50,00,000 in excess of Rs 60,00,000.
Reinsurer 3: Treaty 3: Risk XL Reinsurance of Rs 18,50,00,000 in excess of Rs 1,50,00,000

Each treaty is held with a different reinsurer:

Reserves are set equal to the unexpired risk. The only reserving margins in the company are 10% for mortality risk. All other assumptions for reserving purposes are best estimate. No discounting is allowed for in the reserves. The company holds no IBNR or other reserves for its group term business.

On 31st March 2005 the direct writer had one large group client. The policy renews on the 1st of May every year. The client has three categories of lives:
CATEGORY 1: 4,500 lives with a sum assured of Rs 60,00,000 each;
CATEGORY 2: 500 lives with a sum assured of Rs 1,60,00,000 each.
CATEGORY 3: 8 lives with a sum assured of Rs 20,00,00,000 each.

The best estimate for mortality on all lives at this client is assumed to be 0.8 per 1000 per annum.

(a) Calculate the reserves for this policy on 31st March 2005 excluding the effect of reinsurance. (2)

Three claims are made against the direct writer in April:
One category 1 claim for 60,00,000;
One category 2 claim for 1,60,00,000; and
One category 3 claim for 18, 00, 00,000.

(b) Calculate the total claim amount and the amounts that will be paid by the direct writer and each reinsurer. (5)

(c) Calculate the reserve for the group policy on 31st March 2005 including the effect of reinsurance. (3)

The direct writer is approached by a catastrophe specialist reinsurer and offered catastrophe cover.

(d) Comment on the present reinsurance arrangements of the company and discuss the type of risk that the catastrophe reinsurance would protect the company against. (8)

[18]

Q.8) Describe the different ways expenses could be categorised for a general insurance company when undertaking an expense analysis for pricing purposes. (4)

Explain how the results of such an expense analysis would be included in premium rates and why this is important. (4)

[8]

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