# Actuarial Society of India
# EXAMINATIONS

**18th May 2006**

## Subject ST3 – General Insurance

**Time allowed: Three Hours (02.15* - 05.30 pm)**

***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***
***Hand in BOTH your answer script and this question paper to the supervisor.***

**1** Company A, a direct insurance company, has placed reinsurance with company B for many years, Company A was told in October 2005 by company B that the reinsurance arrangements between the companies would cease in respect of new business and renewals with effect from the following 1 January. Company B has also asked to negotiate a payment to company A to relieve itself of all its liabilities to A at 31 December under current and past reinsurance arrangements.

The reinsurance arrangements consist of:

(a) A 40% quota share treaty covering company A's employers' liability business.

(b) A motor excess of loss treaty with company B liable for INR 7.5M excess of INR 2.5M. There are four known claims outstanding in company A's books where a recovery from company B is expected under the treaty. as follows:

| | *Date of claim* | *Expected recovery* | *Recovery to date* |
|---|---|---|---|
| Claim 1 | July 2000 | INR 3.0M | |
| Claim 2 | Sept 2004 | INR 2.0M | INR 1.0M |
| Claim 3 | Sept 2004 | INR 2.0M | |
| Claim 4 | Sept 2005 | INR 5.0M | |

Describe the considerations that each company would take into account in forming a view on an appropriate level of payment.

**[14]**

**2** A general insurance company has for several years. had a stable portfolio with little growth in total premium income. The accounts for the financial year ending 31 December 2005 are projected to be as follows (figures in Rupees million):

| | |
|---|---|
| Written premium | 150 |
| Underwriting profit/(loss) | (10) |
| Investment income on technical reserves | 15 |
| Free reserves (solvency margin) | 60 |

At present the company invests the whole of its free reserves in short-term deposits which yield 4% interest per annum (on the average of the free reserves at the beginning and the end of the financial year) and whose market value does not change. The company pays no tax or dividends. The company is now considering a policy of significant expansion, and wishes to project the likely effects on its financial position. For this purpose, it is assuming that the present rates of insurance profit (as a percentage of written premium) and investment return will continue in each future financial year.

(i) Calculate the projected return on average capital employed for the year ending 31 December 2005. (4)

(ii) Calculate the maximum level of growth that the company could sustain without weakening its solvency margin (as a percentage of written premium). (2)

As from I January 2006, the company is expecting to increase its total written premiums by 25% compound in each of the next three years.

(iii) Comment on the expected solvency position of the company over this period, illustrating your answer by suitable projections of the figures given above. (5)

(iv) Determine the effect on the solvency margin (as a percentage of written premium ) if the company continues to increase its business at this rate for many years. (3)

(v) The company has decided to increase its solvency margin (as a percentage of written premium). List ways in which this could be done. (3)
**[17]**

**3** A country is setting up a regulatory environment for general insurance. Suggest the measures which could be used to restrict the actions of companies operating in that country.
**[6]**

**4** Describe the following types of reinsurance, their purposes and limitations.

- Quota share
- Surplus
- Risk XL
- Catastrophe XL **[18]**

**5** Describe briefly the factors that should be taken into account when determining the allowance that should be made for future investment return when pricing a general insurance product.
**[8]**

**6** You are the actuary for a recently formed rapidly growing general insurance company in a developing country writing only motor insurance. The assets of the company consist solely of index-linked government securities and cash. Discuss the appropriateness of the investments currently held.
**[7]**

**7** You are a senior actuarial analyst working for a large general insurance company in India that has an extensive motor portfolio. The chief actuary of the company has asked you to investigate, using a stochastic approach, the likely effect on the claim experience of the company of varying the policy excess and ignoring all other factors.

(i) Outline the steps that you will take when carrying out your analysis. (4)

(ii) Discuss other factors that would be considered before implementing any changes to the excess levels. (6)

**[10]**

**8** You are the actuary for a large multinational insurance company selling household building and contents insurance. Your company has been selling policies through the broker network and has been in business for the last 15 years. The company uses geographical location and sum insured as rating factors which is common practice in this particular market.

The chief financial officer of your company is considering the implications of introducing some form of experience rating in order to differentiate the company from the rest of the market and has asked you to analyze the impact of such a move.

(i) Describe different types of experience rating that could be considered. (3)

(ii) Compare the relative merits of different rating options in this circumstance, and make a recommendation between the alternatives. (6)

(iii) Outline the impact that the introduction of experience rating may have on the insurance company and its policyholders. (7)

**[16]**

**9** You are an actuary in a large public sector general insurance company in a developing country. Your chief actuary has asked you to do an expense analysis for pricing purposes. Describe different ways in which expenses can be categorized.

**[4]**

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