Actuarial Society of India

EXAMINATIONS

22nd May 2007

Subject CA3 – Communications

Time allowed: 3 Hours (14.15 - 17.30 Hrs)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. Do not write your name anywhere on the answer sheets. You have only to write your Candidate's Number on each answer sheets.

2. In addition to this paper you should have available Actuarial Tables and an electronic calculator.

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 BOTH the questions.

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 scripts and this question paper to the supervisor separately.

Q.1) You work as an actuary for a general insurance company that writes motor insurance, fire insurance and health insurance business throughout the country. You have prepared the following summary of financial results to be presented in the next senior management meeting:

Company XYZ Insurance

FY 2006	Line of Business			Total
	Motor insurance	Fire insurance	Health insurance	
Premiums	180.0	100.0	50.0	330.0
Investment income	12.6	7.0	3.5	23.1
Total income	**192.6**	**107.0**	**53.5**	**353.1**
Expense Ratio	10.0%	5.0%	15.0%	9.2%
Loss Ratio	110.0%	55.0%	75.0%	88.0%
Combined Ratio	120.0%	60.0%	90.0%	97.3%
Total outgo	**216.0**	**60.0**	**45.0**	**321.0**
Profit	**(23.40)**	**47.00**	**8.50**	**32.10**

All figures are in Rs crores
Footnotes

a. Expense ratio is defined as the ratio of total expenses, including commission, to premium income.
b. Loss ratio is defined as the ratio of claims to premium income

The premium rates for motor insurance and fire insurance are currently controlled by tariffs decided by a regulatory body. Health insurance premiums are free from any tariff restrictions. Tariff restrictions on all lines of business are to be lifted in one year.

The CEO has asked you to prepare a memo, to be discussed in the forthcoming meeting, on how the Company should prepare itself for de-tariffication. Write a response in around 500 words that covers:

- impact of de-tariffication on cross-subsidies in the market
- introduction of risk based pricing
- what action should be taken on premium rates for the various lines of business considering its impact on premium income and profitability

Notes
You may assume that the loss ratio under tariff business for Company XYZ is similar to the general market experience.

You can ignore reinsurance and tax.   **[60]**

Q. 2) Your friend has read the following note from a friend who works in the actuarial department of a life insurer and is unable to understand the concepts explained

"**Stochastic modelling and assessing the adequacy of reserves**"

Reserves are held by insurance companies in respect of existing contracts so as to ensure that companies are able to fulfil policyholder obligations even under adverse scenarios. Given the nature of life insurance contracts where cashflows arise over many years in the future with those cashflows being dependent on a wide variety of parameters principally interest, mortality, lapses and expenses the computation of reserves is somewhat subjective in nature.

The reserves are computed normally by life insurance companies based on certain assumptions about the future elements of experience which have been mentioned above. The assumptions adopted are conservative in nature so as to maximise the reserve which serves as a buffer in the case of adverse experience thereby assuring policyholder obligations under adverse scenarios.

Given the complexity of life insurance contracts it is seldom possible to assure the policyholder obligations with certainty and therefore there will be some possibility however remote that the institution will be unable to meet its liabilities.

This risk is being increasingly quantified through the use of stochastic modelling. Under this technique the elements of the experience are probabilistically modelled. This stochastic approach captures the variability of the parameters explicitly.   The life insurer then runs its stochastic model on various scenarios commonly upwards of 1,000 which is then applied to the cashflows emerging under the contract thereby generating a statistical distribution of reserves. From this statistical distribution the percentile coverage of the existing reserves can be judged. If a greater degree of confidence is required then the existing reserves can be augmented to provide the necessary level of confidence.

Redraft the note in about 350-450 words to make it suitable for sending it to your friend who is not conversant with financial matters.

[40]

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