

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

18th May, 2011

Subject SA3 – General Insurance

Time allowed: Three hours (9.45* - 13.00 Hours)

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. ** 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 answer sheet until instructed to do so by the supervisor*
4. *The answers are expected to be India Specific application for the syllabus and corresponding core reading. However, substantially the core reading material is still taken from material supplied by Actuarial Education Company which are meant for UK Fellowship examination. The core reading also contains some material which is India Specific, mostly the IRDA regulation. In view of this, it should be noted that focal point of answers is expected to be India Specific application. However if application specific to any other country is quoted in the answer the same should answer the question with reference to Indian environment.*
5. *Attempt all questions, beginning your answer to each question on a separate sheet.*
6. *Mark allocations are shown in brackets.*

AT THE END OF THE EXAMINATION

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

Q. 1) You work for a multi-line general insurance company operating out of Mumbai. Notwithstanding the problems faced by the commercial vehicle pool, your chief underwriter is convinced that underwriting opportunities exist if a suitable commercial package policy is designed for State Road Transport Corporations and a select few are included in the book. Your role is to provide the necessary actuarial analyses for this venture. Please answer the following questions with reference to this role:

- i. Identify and discuss four major insurance covers needed by State Road Transport Corporations around which you will design the commercial package policy. (4)
- ii. Identify and discuss the appropriate exposure for each cover you have identified. You will need to provide the appropriate exposure measure for each cover, comment on data accuracy, suggest appropriate proxies, and how you plan to use the exposure data in pricing the product. Discuss how you will verify the accuracy of the submitted data. (10)
- iii. Select two states. Make sure that your selected states are different from each other from the perspective of insurance diversity. Discuss the state specific environmental conditions that are likely to become major cost drivers. Elaborate on how the loss experience from the two states will complement each other so that your book has the benefit of diversification. (6)
- iv. Discuss the kind of reinsurance arrangement that will be appropriate for this book. (5)

[25]

Q. 2) Your company has identified an opportunity in developing a high end medical product. The product will cover neurosurgery and heart surgery. Care will be provided only in a select chain of hospitals throughout the country. Please answer the following questions with respect to pricing this product:

- i. Discuss the data needed for pricing this product and your most likely source(s). (4)
- ii. Discuss why a GLM procedure would be appropriate to price this product. The two main components of the pricing structure should be included in your discussion. (4)
- iii. Discuss the properties of distributions that are appropriate to model each of the two main components of the pricing model. You should discuss one distribution each for the two main components of the pricing model. (7)
- iv. Describe how to estimate the appropriate parameters for each of the two selected distributions. Carefully describe the dependent variables, the predictor variables, their inter-relationships, and how the structural equations capture these nuances. (10)

[25]

Q. 3) You are the Appointed Actuary of a medium sized general insurance company writing all lines of business in India.

In the past year the Insurance regulators have asked each general insurance company to submit to the regulators a 'Financial Condition Report' which would help the regulator make an assessment of the financial strength of the general insurance company both for the immediate past year and also for the next two future years.

The regulators have not prescribed a format for the report and have left it to the Appointed Actuary of each general insurance company to submit the report in a format most appropriate for the company he / she is working for

- i) The Board of Directors have asked you to prepare a note including the
 - a. various analysis you would include in the financial condition report
 - b. sources of data for the analysis
 - c. conclusions you will draw from the analysis (20)

The Board has also asked you to develop a non-parametric 'Early Warning System' to help the Board and Senior Management detect financial weakness of the company before it actually happens.

- ii) Outline the analysis you would include in the Early Warning System and the ranges of value outside which the Warning System will be triggered. (10)

The Board of Directors of your company is looking as acquisition, of another general insurance company, as a means to grow the market share of the company in the general insurance business. The Board wants you to submit a note detailing the actuarial valuation of a general insurance company.

- iii) Draft a note explaining the theoretical framework for valuation of a medium sized general insurance company writing all lines of business for the last 9 years. (20)

[50]
