INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

29th October 2015

Subject ST7 – General Insurance: Reserving & Capital Modeling

Time allowed: Three 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. ** You have 15 minutes at the start of the examination in which you are required to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You have then three hours to complete the paper.*
3. *You must not start writing your answers in the answer sheet unless instructed to do so by the supervisor.*
4. *The answers are not expected to be any country or jurisdication specific. However, if Examples/illustrations are required for any answer, the country or jurisdiction from which they are drawn should be mentioned.*
5. *Attempt all questions, beginning your answer to each question on a separate sheet.*
6. *Mark allocations are shown in brackets.*
7. *Please check if you have received complete Question paper and no page is missing. If so, kindly get a 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) You have been appointed as a consultant actuary of a newly established general insurance company. The company plans to underwrite a mix of property and liability class of business. The Finance Director (FD) is aware that the company can analyze its claims experience in a few different ways. The FD has requested you to explain briefly the principles of each method, including treatment of IBNR claims and discuss each method's advantages and disadvantages. **[9]**

Q. 2) A small regional focused general insurance company currently only writes motor, commercial property and household risks. The company wishes to introduce a new long term individual personal accident (PA) cover to be sold along with its long term household cover. Company aims to sell the product through a large bank operating in the country and region.

The PA cover will have a term of 10 years and policyholders can buy PA benefits in units, with premium being charged at INR 5,000/unit, payable at the start of the term.

Each unit pays a monthly income of INR 2,000, payable at each monthly anniversary of the policy from the policyholder's accidental death until and including the end of the term. In addition, a lump sum of INR 1,00,000 per unit is payable at the end of the term, if the policyholder has died as the result of an accident during the term of the policy.

The PA product is priced such that it is expected to be profitable and the company does not wish to arrange any reinsurance for protecting this class of business.

i) Describe in detail how you would set technical reserves (undiscounted) for this PA policy. (16)

ii) Suggest, with reasons, the type of reinsurance that this company might purchase for each of the products. (10)

[26]

Q. 3) An established large general insurance company writing mainly motor class of business is looking to underwrite liability risks. You are working as an analyst within the actuarial department.

i) IT department has requested you to list data requirements in respect of claims records to be included for the new class of business. (3)

ii) Illustrate examples of errors that might be made when entering the claims data into system. (4)

The company has acquired liability book from a small general insurance company who had been writing liability risks for four years. The head of actuary is looking to build a stochastic model using a new software platform with results based on 5,000 simulations.

iii) Describe the main areas of uncertainty in the model. (8)

[15]

Q. 4) A country 'GI-Land' is considering opening up its general insurance market to private players. The parliament of the country had set up a committee to come up with a roadmap for this liberalization. The committee has asked interested persons to make representation before it on the regulatory regime the country should adopt for insurance market.

i) List and describe the various regulatory regime options available before the committee. (4)

The committee after consultations presented its report to the parliament. One of its key recommendations is to set up a regulator for the insurance market with a clear mandate.

ii) Suggest possible objectives which could be considered as a mandate of the proposed regulator? (2)

iii) Select top 2 objectives you would recommend and state its benefits. Assume country 'GI-Land' is a developing economy with a very low savings rate, insurance penetrations and capital output ratio. (4)

iv) List possible costs associated with regulation which the committee may consider and minimize, where possible. (4)

[14]

Q. 5) Define following terms

i) **a)** Principle of Indemnity (1)

b) Subrogation (2)

ii) Moral hazard (2)

[5]

Q. 6) A company has the following reinsurance treaties for its commercial property business written in 2015:

a) 10% compulsory QS

b) 10 line first surplus treaty on PML basis, with a fixed PML retention of INR 12.5 crores

c) 10 line second surplus treaty on PML basis

The company has written below policy

Figures in INR crores	**Premium**	**Sum Insured**	**PML**
Policy 1	94.90	949.00	30% of sum insured

A claim of INR 200 crores originated from the policy.

i) For the above reinsurance arrangement calculate the premium and claim amounts for each of the parties involved including the ceding insurer. (6)

ii) Explain with example, why PML may have been used over sum insured in above treaty as a measure of risk (3)

[9]

Q. 7) A multiline general insurer has suffered large losses last financial year. In the financial report, the company has attributed the causes of loss to reserve deterioration and unexpected large claims. Further, these losses have deteriorated the financial position of the company and it faces the risk of losing its current credit rating of AA. The company has appointed the consultancy you work for, to model the capital requirement for retaining credit rating and also understand the sources of capital requirement to take informed strategic decisions.

i) Create a note to be presented to insurance company's management comparing deterministic and stochastic modelling approaches for the above mentioned exercise. (9)

ii) What factors will you consider for selection of the modelling approach? (4)

iii) Discuss the various capital allocation methods which could be used for allocating final required capital arrived from this exercise by its risk drivers. (3)

iv) Suggest different step company could take to lower its rating agency capital requirement. (4)

v) List different sources of capital which could be used by the company to strengthen its financial position (2)

[22]

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