INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

21st May 2009

Subject ST3 — General Insurance

Time allowed: Three hours (14.15* pm – 17.30 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 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.*

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)   **(i)**   Outline briefly the reasons why statistical methods may not be appropriate for estimating
            outstanding claims reserves.   (2)

            (ii) Set out possible sources of error when using statistical methods.   (5)

A general insurance company writes a large portfolio of household contents policies. The gross
written premium for the financial year ending 31 December 2008 was INR 350 Crore. The gross
written premium in each of the four previous financial years was INR 300 Crore. The
development of gross claim payments for each accident year up to 31 December 2008 is as
follows:

Accident	Development Quarter															
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2005	24	65	100	154	194	218	239	250	260	264	269	281	271	278	279	302
2006	21	55	95	139	174	198	218	230	238	243	246	259				
2007	28	69	108	168	203	233	261	274								
2008	26	71	111	174												

            (iii) Calculate the outstanding gross claims reserves as at 31 December 2008 using the basic
            chain ladder method on annualised data, stating any assumptions you make.   (4)

            (iv) Identify the elements of technical reserves as at 31 December 2008 that would not be
            included in the gross outstanding claims reserves amount calculated in iii) and the
            technical reserves that may only be partially included.   (2)

            The insurer is considering whether to use the basic chain ladder or Bornhuetter-Ferguson
            methods to calculate its outstanding claims reserves.

            (v) Discuss the advantages of using each method over the other.   (4)
                                                                                                                  [17]

Q 2)   A recently established general insurance company with small free reserves is reviewing its
            reinsurance arrangements. The company writes motor, commercial fire business and
            professional indemnity business.

            i)   Discuss the types of reinsurance cover that the company should consider.   (6)

            ii) Comment on how your answer to part (i) would differ if the company was well
            established and had significant excess capital.   (2)
                                                                                                                   [8]

Q 3)   **i)**   Discuss briefly the implications of a general insurance company's solvency margin falling close to the minimum statutory solvency margin. (4)

      ii)   Explain why it may be inappropriate to assess the relative financial strengths of general insurance companies by reference to their published solvency margins. (5)
[9]

Q 4)   Describe the investment and expense risks associated with a general insurance company that only writes personal motor insurance **[14]**

Q 5)   A recently formed general insurance company writes a commercial fire insurance portfolio that represents approximately 25% of its total account. The company purchases excess of loss reinsurance from a leading global reinsurance company. The reinsurance purchased is with covered layer unlimited XS 1000 with the following parameter values (usual notations):

- Insurance company's premium loading factor $\theta = 0.5$

- Expected claim amount $m_1 = 1000$

- Expected number of claims $\lambda = 5$

- Reinsurance company premium loading factor $\xi = 0.25$

The equation to derive the adjustment coefficient R for a gross account is $\lambda + cR = \lambda\, M_X(R)$.

Determine the equation that would allow derivation of the adjustment coefficient R for the net of reinsurance account, assuming the claim amount distribution is exponential. **[7]**

Q 6)   You are an actuary working for a small general insurance company. The chief underwriter has contacted you to assist him in designing a new product liability insurance product for manufacturers in the local country.

      (i)   Define product liability insurance. (1)

      (ii)   Identify the main risk factors and rating factors for product liability insurance. (3)

      (iii)   Outline the risks you would consider while designing the product. (12)

      (iv)   Discuss how the company could mitigate the risks outlined in part (iii). (6)
[22]

Q 7)   A medium-sized general insurance company writes commercial fire insurance.

    i)   List the data that should be captured in the pricing (or underwriting) and claims database. (7)

    ii)   Outline the risks to the company of incorrect or incomplete data capture in the above databases. (7)

    iii)   Explain measures that the company could put in place to ensure accurate data was captured. (5)

    iv)   Outline the different types of analyses that could be conducted using the policy and claims data. (4)

[23]

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