

# INSTITUTE OF ACTUARIES OF INDIA

## EXAMINATIONS

14<sup>th</sup> September 2016

Subject SA3 – General Insurance

Time allowed: Three hours (14.45\* - 18.00 Hours)

Total Marks: 100

### INSTRUCTIONS TO THE CANDIDATES

1. *Please read the instructions inside the cover 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 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 is 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 candidate 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.*
7. *Please check if you have received complete Question Paper and no page is missing. If so, kindly get 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 asked to develop an internal capital model at end of 2016 for Global Co a medium sized insurer writing multiple lines of business in India.
- i)** List the reasons a company would consider using an internal model to determine regulatory capital and the considerations relevant to a company developing an internal model for determining regulatory capital. (5)
- ii)** You have basic knowledge of Global Co (e.g. lines of business, company structure) and access to Global Co's financial information. The next step is to obtain qualitative information from internal stakeholders. List the questions you would ask:
- Underwriters
  - Reinsurance team
  - Investment team
  - Risk Management (6)
- iii)** The Chief Financial Officer (CFO) of Global Co has asked you to adopt 2016 financial performance as inputs to the Internal Capital Model. What are the limitations of this approach? What CFO changes his suggestion to 2017 budget? (3)
- Two months after the balance sheet date, the CFO comes rushing into your office.
- “We have a major problem. One of our investment managers has been running a fraudulent investment operation (paying returns to separate investors from money paid by subsequent investors, rather than from any actual profit earned) for several years. We've lost most of our capital and our solvency ratio right now is just above 150%.”
- iv)** You have been asked to prepare the Financial Condition Report for Global Co. The CFO has asked you to consider the impact of this event and make recommendations to the Board. Briefly describe the recommendations you would make in the following sections of the FCR:
- Assets
  - Capital management
  - Pricing and premium adequacy
  - Risk management (8)
- v)** Given the recent spate of natural disasters, uncertainty in the global economic climate and added volatility in share and debt markets, IRDA has asked you to conduct a review of the current factors used in the IRDA regulations required solvency margin calculation to determine regulatory capital.

Describe a high level approach you would take to conduct the review and list the information that you would require from insurers as part of the review. (5)

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- Q. 2)** You are an actuary working for general insurer JoyCo, which has just gone through a merger with another general insurer Repco. The two entities have become a single statutory entity called Swan Insurance.

You have been appointed to lead a team to align pricing methodologies and premium rates across all distribution channels of the new entity for the commercial insurance packaged portfolios.

- i) List all functions of Swan that will be impacted by the pricing alignment project and how they will be impacted. (5)
- ii) What are the risks of the project? What mitigants would you recommend for each risk? (5)

Your analyst has provided you with the current projected loss and expense ratios for the two pre-merger companies by the significant coverages, which are set out below. Expense ratios are taken from the recent budgets for JoyCo and RepCo.

#### JoyCo

Cover	GWP (Rs mill)	No of policies covered	Net claim cost*	Reinsurance premium	Fixed expenses	Commission	Other variable expenses	Required Profit
Fire, General Property & Burglary	120	100,000	40%	12%	5%	20%	17%	4%
Business Interruption	12	40,000	56%	12%	8%	20%	17%	4%
Liability	20	70,000	60%	0%	4%	20%	5%	10%
Total	152	210,000	44%	10.4%	5.1%	20%	15.4%	4.8%

\*Includes claims handling expenses.

Amounts expressed as a percentage of gross written premium

#### RepCo

Cover	GWP (Rs mill)	No of policies covered	Net claim cost*	Reinsurance premium	Fixed expenses	Commission	Other variable expenses	Required Profit
Fire, General Property and Burglary	70	110,000	66%	11%	10%	15%	15%	4%
Business Interruption	15	75,000	70%	11%	10%	15%	15%	4%
Liability	15	50,000	45%	2%	10%	15%	15%	10%
Total	100	235,000	63.5%	9.7%	10%	15%	15%	4.9%

\*Includes claims handling expenses.

Amounts expressed as a percentage of gross written premium

- iii) Stating any assumptions you make, for each company, calculate insurance profit by coverage and in total. (4)
  - iv) What are your observations about the performance of the two companies? (3)
  - v) Assuming that expense levels and rates, including reinsurance rates, will not change, what change in average premium would be required to ensure that the Fire, General Property and Burglary cover for RepCo meets its expected profit level? (4)
  - vi) What issues would need to be considered prior to implementing the premium change determined in part (v) as part of an exercise to align pricing for Swan? (2)
- [23]**

**Q. 3)** A large casualty reinsurer writes medical malpractice insurance, amongst other product lines. The reinsurer has been writing this product line for ten years. The annual IBNR claim reserving exercise is due shortly.

- i) List the most common constituents of total claims reserves that would be reported on a reinsurer's balance sheet. Define what each denotes/signifies. (5)

Historically, the Chief Actuary of the reinsurer has been estimating IBNR claim reserves using three methods viz., paid and incurred chain ladders by various cohorts, Frequency-Severity method and Bornhuetter-Ferguson (B-F) method (on both paid and incurred). The final chosen estimate has been the higher of the paid and incurred estimates in the B-F Method.

The reinsurer's claim frequency in this product line has till date been lower than the industry average. The Chief Actuary's primary concern however is the inherent uncertainty in the product line that lies in it being significantly long tailed.

- ii) Explain the practical issues that make the medical malpractice product line 'significantly long tailed'. (10)

- iii) a) Discuss the appropriateness of each of the three methods cited above for the product line. (9)

- b) 'The final chosen estimate has been the higher of the paid and incurred estimates in the B-F Method.'  
Comment on this rationale. (2)

- c) Mention in detail the various actuarial analyses that need to be carried out on premium and claims information as part of the claim reserving exercise. (6)

- iv) The reinsurer has a mix of proportional and non-proportional treaty contracts with various ceding insurers. The following reinsurance terms/clauses appear in its most treaty wording:

- a) Stability Clause
- b) Annual Aggregate Deductible
- c) Commutation Clause
- d) Cancellation clause
- e) Loss Corridor
- f) Sunset clause

Define each of the clauses above. What further claim analyses would need to be carried out to assess the impact of above treaty clauses on IBNR reserves? (18)

**[50]**

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