INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

23rd November 2023

Subject SA3 – General Insurance

Time allowed: 3 Hours 15 Minutes (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. ***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.***
3. ***Attempt all questions beginning your answer to each question on a separate sheet.***
4. ***Mark allocations are shown in brackets.***
5. ***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. You are not allowed to carry the question paper in any form with you.

Q. 1) You are a Reserving Actuary working with a multi-line non-life insurer in India.
One of the Independent Directors of the Board who is new to the insurance sector made the following observations during a quarterly Board meeting:

The reserving basis of the insurer seems to be weaker compared to others in the market referencing the lower than average ratio of the Net Technical Reserves to Net Earned Premiums

i) Discuss this observation on reserving strength made by the Independent Director of your Company's Board. (5)

The Independent Director has further noticed that the change in reserving basis has led to a reduction in reserves held this year when compared against last year. She opines that the reserving basis should not be changed year-on-year.

ii) Discuss the factors that may cause the reserving basis to change over valuation periods. (10)

A junior member of your team who is an avid investor in equity markets opines that if two non-life insurers have similar top-line and bottom-line results, their market valuation should also be similar.

iii)

a) List different valuation methods that are generally used to value non-life insurers. (3)

b) What are the implicit assumptions made by the junior member in your team? (5)

c) Outline the reason for non-life insurers with similar top-line and bottom-line results having widely different market valuation. (10)

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Q. 2) You are a Consulting Actuary with Actuarial Projects. Your firm provides advisory services to non-life insurers in areas like pricing and portfolio management.

i) Discuss the risk management practices that a non-life insurer should follow when reviewing an insurance proposal for the following:

a) Road construction projects under Contractor's All Risk insurance with Advance Loss of Profits (ALOP) cover (5)

b) Livestock insurance (5)

Actuarial Projects also provides advisory services to Municipal authorities/Government agencies involved in infrastructure project evaluation to help meet lower carbon emission goals. Social discount rate is often employed at the project appraisal stage.

ii)

a) Explain the rationale for choosing the Social Discount Rate. (2)

b) Discuss the factors (including ethical issues) to be considered in determining the Social Discount Rate. (5)

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Q. 3) "Risk Based Capital" (RBC) framework, Economic Capital and IND AS 117 adopt a cashflow based approach for arriving at the technical liabilities for General Insurance business. Best estimate liabilities and risk margin both need to be estimated in place of the undiscounted claim reserves as defined by IRDAI (Assets, Liabilities and Solvency Margin of General Insurance Business) Regulations, 2016.

You are the Appointed Actuary of a mid-sized general insurance company with exposure to Motor, Health and Crop lines of business. The company is transitioning to RBC and IND AS 117 as stipulated by the regulator. You are in the process of setting up systems for arriving at the best estimate liabilities and risk margin.

i) Explain how best estimate liabilities vary from reserves projected using the Chain ladder method/ Bornheutter-Fergusson method. Also, explain the diagnostics which can be employed to assess if the best estimate reserves only get booked. (10)

ii) Risk margin requires assessment of uncertainty, which in turn requires consideration of the potential for differences in future claims experience when compared against past experience available from loss triangulations. List the potential sources of uncertainty which may lead to volatility in assessment of liabilities. (5)

iii) Discuss different methods available which may be employed in arriving at risk margins. Detail any one method, clearly outlining the data requirements and methodology for the same, using Crop insurance as reference. (10)

iv) Since the best estimate liabilities with risk margins incorporated need to be converted to cashflows, for arriving at a discounted cashflow model, explain the steps involved in arriving at the cashflows stating assumptions and limitations of the same. (10)

With the increase in natural disasters globally, it has become essential to consider catastrophe risk explicitly for capital modelling purposes. Non-modelled risks are common in cat risk parlance. Non-modelled risks are defined as "Any potential source of non-life insurance loss that may arise as a result of catastrophic events, but which is not explicitly covered by a company's use of existing catastrophe models."

v) Explain possible non-modelled risks which may not have been captured by the cat risk models. (10)

vi) Describe how non-modelled risk can be quantified for capital purposes. (5)

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