INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

15th March 2018

Subject ST7 – General Insurance: Reserving and Capital Modeling

Time allowed: Three Hours (10.15* – 13.30 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 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 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.*
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. You are not allowed to carry the question paper in any form with you.

Q. 1) Explain the meaning of each of these terms and specify the type of insurance these are usually associated with.

    i) Knock for Knock Agreement   (2)

    ii) Retroactive Date   (2)

    iii) Business Interruption cover   (2)

                                 [6]

Q. 2) XYZ insurance company limited had budgeted for an underwriting loss of Rs. 12 Crores for the Financial Year 2017-18. Based on the performance review, the following points emerge-

- Reinsurance claims recoveries were estimated to be less than budgeted by Rs. 3 Crores.
- Deferred Acquisition Cost at the year-end was estimated to be more than budgeted by Rs. 5 Crores.
- Additional Unexpired risk reserve of Rs. 2 Crores had to be kept at the year-end which was not budgeted.
- Opening unearned premium reserve was found to be incorrectly more by Rs. 8 Crores. This was rectified in the current year.
- Commissions paid were estimated to be Rs. 3 Crores less than budgeted.
- IBNR reserve at the year-end was estimated to be Rs. 2 Crores lower than budgeted.

What will the revised forecast for the underwriting profit/loss for XYZ insurance company limited for Financial Year 2017-18 be?   **[3]**

Q. 3) **i)** State various sources of uncertainty for the following risk:
    a) Reserve Risk   (2.5)

    b) Operations Risk   (2.5)

    ii) Discuss the effect of parameterizing various risks of the capital model in the scenarios given below. Also, state the impact on capital
    a) An unanticipated court award in Motor TP claims which is 30% higher than similar court awards in the past.   (6)

    b) Sudden exchange-rate drop in USD currency vs INR currency for an insurance company in India having substantial business underwritten in USD.   (6)

                                 [17]

Q. 4) State possible sources of variation in financial loss ratios among various companies. Financial loss ratios are based on year of accounting.   **[6]**

Q. 5) Two general insurance companies in India, Company X and Company Y are planning a merger. Discuss the possible data challenges joint company XY is likely to face after merger.   **[10]**

Q. 6) A general insurance company has been writing crop insurance for past few years. The regulator has approached the actuary to discuss various aspects of determining the company's total claims liability for crop insurance

    i) What is crop insurance? Discuss two common forms of crop insurance.   (4)

ii) Discuss why triangulation based reserving techniques are not very useful for determining the ultimate liability for crop insurance. (5)

iii) Discuss how the company can determine the ultimate liability for crop insurance. (4)

iv) The Company wrote INR 400 crores business for Kharif season. The premium earning was 5% each in the first 3 months, 15% in the fourth month and 70% in the fifth month. It was confirmed that yield estimates will happen uniformly over the fifth month. Further there is a 1 month delay expected in the reporting of the claim. Stating all assumptions made, estimate the IBNR the company should hold at the end of each month on a best estimate basis. Consider:

Expected ULR: 80%

Shortfall in yield (based on yield estimate): INR 300 crores (6)

v) The actuary has also provided various scenarios for IBNR estimation. Discuss the main reasons for providing such scenarios. (3)

[22]

Q. 7) You are an actuary working with Innovative Insurance Company Limited in a country called Digitaland. The Sales department has advised the CEO about the rising demand for insurance products for people dealing in crypto-currencies.

Crypto-currencies are digital currencies which are considered as a legal tender in Digitaland. These are created by a process called mining. These mining operations require use of multiple high performing specialized machines and set of talented programmers who can create complex hashing algorithms. Once mined, these crypto-currencies are stored in digital wallets from which they can be used as currency or can even be traded on an online currency trading platform.

The CEO has asked you to do the following-

i) Identify various entity segments involved in dealing of crypto-currencies and discuss insurance needs for each of these segments. (10)

ii) Advice on the risks and uncertainties associated with profitability of such insurance offerings. (10)

iii) Discuss ways of reinsuring the risks to optimize the risk retained by Innovative Insurance Company Limited. (6)

iv) Assist in setting up investment strategy for this product (4)

Recently, there has been high volatility in Crypto-currency prices. This has led to insurance companies adopting various unethical ways of avoiding the claims/exposure. This has resulted in decline of market confidence for this product. The insurance regulator of Digitaland is concerned about this and has set up a committee to consider various corrective actions.

v) Suggest ways in which the insurance regulator can regulate this product to maintain market confidence (6)

[36]

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