

# INSTITUTE OF ACTUARIES OF INDIA

## EXAMINATIONS

6<sup>th</sup> September 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)** You are an actuary working with Underwriting Excellence Company Limited (UECL). The company began its operations in the year 2013 and since then it has been growing at a rapid pace. The company predominantly writes short tailed business and hence it did not employ any actuarial resource until your appointment recently.

You have been provided some key numbers from the financials for all the years. (Rs. crores)

Particulars	2013	2014	2015	2016	2017	2018
Net Written Premium for each year	25	50	100	200	300	325
Investment Income for each year	3	4	5	6	7	7
Commission for each year	1	2	4	8	12	13
Reported Net Claims O/s at end of each year	2	9	17	35	49	74
Net Claims Paid in each year	3	12	40	103	186	196
Dividends Paid in each year	1	2	3	4	5	6
Expenses for each year	2	4	8	16	24	26
Net IBNR at end of each year	2	4	12	24	34	44
Net Earned Premium for each year	8	24	64	152	240	264

- i) Calculate the underwriting result for UECL for each year. Assume no deferred acquisition cost. (2)
- ii) Calculate incurred claims ratio and combined ratio for UECL for each year. (4)
- iii) Compare the trends of underwriting result and combined ratio and comment on the performance of UECL. (5)

You have been able to gather some information to prepare the paid and incurred claims triangles on accident year basis. However, some information is not complete.

Cumulative Paid Claims Triangle

Accident Year/Lag	0	1	2	3	4	5
2013		5		8	8	8
2014		14	18		25	
2015	34		52	59		
2016	88	107	121			
2017	155					
2018	157					

Incremental Incurred Claims Triangle

Accident Year/Lag	0	1	2	3	4	5
2013			1	0	1	0
2014	18	2		1	2	
2015		5	5	7		
2016	114		8			
2017	188	3				
2018						

- iv) Based on available information from financials, you are required to fill the empty boxes in the triangle. (4)

- v) Calculate the IBNR reserve based on Chain Ladder Method on incurred and paid basis. State any assumptions that you make. (7)
- vi) UECL currently reserves for IBNR on an Expected Ultimate Loss Ratio method based on underwriter's judgment. The underwriter tells you that consistently over the years the actual loss ratio (w/o IBNR) has never exceeded the Expected Loss Ratio hence for a short tailed portfolio it is prudent in nature. Verify this statement and discuss the appropriateness of this approach. (5)
- vii) Comment on the current IBNR held in the books, does this analysis change your view of performance of UECL as per (iii)? (3)
- viii) Calculate Unexpired Risk Reserve (URR) for UECL as at the end of 2018. State any assumptions that you make. (2)
- [32]**
- Q. 2)** Explain the meaning of these terms and specify the usage in insurance for them.
- i) Hours Clause (2)
- ii) Letter of Credit (2)
- iii) Ogden Tables (2)
- [6]**
- Q. 3)** An international sports organization named Federation of Sports Association (FISA) has requested your company to help design an insurance product for its upcoming international world cup event in which 200 athletes from 25 countries will participate in 5 different sporting events. These will be conducted in 4 different cities in FISA's own stadiums across a period of 35 days. The events will be telecasted throughout the world and the overall expected visitors for these events are expected to be more than 2 million.
- Suggest and discuss the possible covers which you can offer in the product for such an event. State the measure of exposure that can be applied for such covers in this product and state any assumptions that you make. **[12]**
- Q. 4)** i) State the components of a capital model and the assumptions underlying each. (15)
- ii) Describe how insurance risk and credit risk can lead to liquidity risk (7)
- [22]**
- Q. 5)** As a consulting actuary, what are the process checks you would perform during the peer review of a reserving actuary's work? **[8]**
- Q. 6)** The regulator has asked you (a consulting actuary) to join an industry task force in creating appropriate data protection laws and consequences for insurance companies if these are violated. List the possible issues. **[10]**
- Q. 7)** Describe the modelling necessary to assess the required capital for an insurance company setting up a new line of business. **[10]**

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