INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

25th May 2024

SP7 - General Insurance Reserving and Capital Modelling

Time allowed: 3 Hours 15 Minutes (14.45 – 18.00 Hours)

Total Marks: 100

Q. 1)

i) What are latent claims? (2)

ii) Describe how judicial decisions can aggravate the uncertainty surrounding latent claims. (8)

iii) Describe any one reserving technique that could be used to determine the ultimate loss amounts for latent claims. (2)

[12]

Q. 2) You are an actuary working for a large general insurance company who writes a wide range of personal lines products. The company is looking to launch a new product which provides coverage to individuals in relation to their wedding events. You have been asked by the head of personal lines, who wants to understand the product features of wedding insurance product, to describe the following:

i) Benefits and insured perils (4)

ii) Restrictions and Exclusions (3)

iii) Basis of cover (1)

iv) Measure of exposure (1)

v) Claims characteristics (3)

vi) Risk/rating factors (3)

[15]

Q. 3) A general insurance company uses average cost per claims (ACPC) method to estimate reserves for its motor account as the claim frequency and average claim size follow different trends. It applies ACPC method to the claims adjusted for inflation at the rate of 5% p.a. Following is the claims data available for its motor account as at 31st December 2023. Estimate the Incurred but not reported reserves as at 31st December 2023, stating any assumptions made.

i)

Accident Year	**Claims incurred(in INR '000s) in year of development>>**					
2018	12,000	10,800	9,720	8,748	7,873	7,086
2019	12,500	11,250	10,125	9,113	8,201	
2020	13,005	11,705	10,534	9,481		
2021	14,000	12,600	11,340			
2022	15,890	14,301				
2023	17,800					

Accident Year	Number of claims incurred in year of development>>					
2018	250	188	141	113	90	77
2019	275	206	155	116	104	
2020	289	144	101	81		
2021	303	152	121			
2022	318	159				
2023	334					

(18)

ii) Outline the considerations that need to be taken into account when using ACPC method. (5)

iii) List factors relating to the external environment that may affect claim frequencies or average claim size for motor insurance policies. (8)

[31]

Q. 4) Country A is moving towards "Risk based capital" (RBC) framework from factor-based approach.

In light of this statement, answer the following:

i) What are the perceived benefits of moving to RBC as per the regulator of Country A? (4)

ii) Outline the key risks that should be considered in the computation of RBC? (5)

iii) The insurer is required to calculate reserves on a best estimate basis and an explicit risk margin. Due to this requirement the Company wants to transition from deterministic to stochastic reserving.

You as a reserving actuary have been asked by the chief actuary to calculate the stochastic reserves by the Mack method and Bootstrapping the ODP model. Describe the two approaches to calculate the same. (6)

[15]

Q. 5)

i) Explain what is catastrophe bond and how it can be used to protect against financial losses arising due to climate change? Explain three characteristics of catastrophe bonds. (5)

ii) Outline two other ways of controlling climate risk other than catastrophe bond. (2)

[7]

Q. 6) A medium-sized insurance company, Company A started writing engineering and fire risks in 2018.

It writes 3-year engineering (mainly construction) policies. All these policies are written on 1st January of the respective underwriting year. The company uses a linearly increasing earning pattern year on year to calculate earned premium for this line of business. The

following information is provided as at 31st December 2023, with respect to its engineering portfolio:

Accident Year	Gross Written Premium (in INR '000s)	Gross Incurred Claims (in INR '000s)
2018	18000	150
2019	20000	1,919
2020	36000	22,962
2021	39600	11,083
2022	43560	19,615
2023	65340	24,866

i) Calculate the gross loss ratios for 2018-2023, stating any assumptions made and specify the reasons for the observed loss trends. (10)

The local insurance regulatory body of Company A, has decided to remove the engineering and fire tariffs with effect from 1st January 2024. Industry predicts that this change will lead to a price war that could reduce premiums charged to an unsustainably low level.

Company A's reserving team is about to perform a reserving exercise on an accident quarter basis as at 31st March 2024.

ii) Describe the factors they should consider during the reserving exercise for these lines. (6)

iii) Describe the reserving methods that could be used to estimate IBNR for the current accident period for these lines, with reasons. (4)

[20]

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