

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

3rd December 2022

Subject SA1 – Health and Care

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 working in a large Indian Health & Care Insurance company for which the total claims (in INR crores) for IP, CI, LTCI & PMI Lines Of Business (LOB), over the last 5 Financial Years (FY) are provided below:

FY / LOB	IP	CI	LTCI	PMI
2017-18	77	67	69	40
2018-19	87	107	75	104
2019-20	63	53	76	30
2020-21	23	55	81	76
2021-22	75	43	49	50
Mean	65	65	70	60
Standard Deviation	25	25	12.5	30

The company is evaluating proposals for stop loss reinsurance arrangements on each of the LOBs separately. The volume of portfolio for each LOB remained almost static over the years.

- i) On the basis of these statistics, explain with reasons, which LOB should have the largest and smallest risk premiums for each of the following stop loss covers in turn:
- a) 100% of excess claims over INR 70 crores. (6)
- b) 100% of excess claims over INR 100 crores. (6)
- c) 100% of excess claims over INR 90 crores, capped at INR 25 crores. (6)
- ii) To compare the quoted reinsurance premiums, your manager asked you to calculate the historic burning cost pure premium for each LOB and for each of the stop loss covers. Provide your calculations and comment on your answers. (6)
- iii) Describe briefly the evaluation process of a stop loss treaty. (8)

Your company has an overseas subsidiary health and care insurance company that is subject to the EU Solvency II regime & has recently ceased to transact new business. The in-force business comprises Impaired life Immediate Annuities, unit-linked and conventional pre-funded long-term care insurance policies and long term critical illness insurance contracts. The pre-funded long-term care insurance policies (both unit-linked & conventional) have the option of paying unlimited top-up premiums during the terms of the policies where each top up premium adds benefits in the policy equivalent to the single premium of same amount. The Impaired Life Immediate Annuity portfolio has backing assets of Government & Corporate bonds at 50:50 ratio. The corporate bond yield spread is 1.50% p.a. in which 0.50% p.a. corresponds to default risk and the Government bond yield are considered as risk free rates. You have been asked to determine the embedded value of the subsidiary to evaluate an offer made for buying the subsidiary. The embedded value is determined as the sum of net assets (defined as the excess of assets over both liabilities and solvency capital requirements) and Present Value of the In-Force business (PVIF) component.

- iv) List down the conditions to be satisfied in order to use 'matching adjustment' for valuation of the Impaired Life Immediate Annuity portfolio. Also indicate the expected extent of the 'matching adjustment'. (5)
- v) Describe the method to calculate the embedded value as defined above. (10)

- vi)** Discuss how you would treat the top-up option for long-term care insurance policies in the embedded value calculation. (3)
[50]

Q. 2) WayToHealth (WTH) is an insurer operating in a developed country ‘A’ with well-regulated health and care insurance industry for many years. It specializes in individual long-term income protection insurance with premium rates guaranteed for the full duration of the policy.

- i)** Outline the typical key features of an individual income protection insurance product. (5)

- ii)** Explain the advantages and disadvantages to WTH of offering guaranteed premium rates. (7)

The Sales Director of WTH suggested that an income protection product covering only disabilities caused by accidents should be explored.

- iii)** Outline the possible reasons for the suggestion and the risks associated with such a product. (6)

WTH is exploring expansion into a developing country ‘B’ where the State provides no disability or sickness benefits to its citizens. While there is a large health insurance market, Income protection insurance is virtually non-existent in Country B.

- iv)** Describe the factors that should be considered by WTH before deciding on entering Country B. (12)

- v)** How would the premium rating factors differ between country ‘A’ and country ‘B’ and why? (5)

WTH decided to enter Country B with reviewable premium rates product sold only via its website. The premium rates are guaranteed for the first 5 years and reviewable yearly thereafter.

- vi)** Discuss the possible reasons behind WTH’s decision. (5)

- vii)** Describe how the premium rates review process will work. (10)
[50]
