

# INSTITUTE OF ACTUARIES OF INDIA

## EXAMINATIONS

21<sup>st</sup> October 2009

**Subject ST1 — Health and Care Insurance**

**Time allowed: Three hours (14.45\* pm – 18.00 Hours)**

**Total Marks: 100**

### INSTRUCTIONS TO THE CANDIDATES

1. *Please read the instructions on the front 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 to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*
3. *You must not start writing your answers in the answer sheet until 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.*

**AT THE END OF THE EXAMINATION**

**Please return your answer book and this question paper to the supervisor separately.**

- Q 1)** A health and care insurance company writes a significant volume of health insurance business. New business volumes have fallen by 40% over the past six months.  
Describe the possible reasons for the fall in new business. **[10]**
- Q 2)**
- (i)** Explain how a CI product is linked to need of health insurance. (3)
  - (ii)** Describe how an individual's need for different types of private health insurance may be linked with age of the individual. (8)
  - (iii)** List other factors that may affect the demand for health insurance. (4)
- [15]**
- Q 3)**
- (i)** List the types of reserves a healthcare insurer is expected to make provisions for both long term and short term insurance business, indicating which of the reserves are subject to the most uncertainty. (5)
- You are the actuary to a health insurer which writes short-term health insurance. As per your calculations the IBNR reserves, as of 31 Dec, 2008 are estimated to be Rs 99.78 crores. You recommend that a provision of Rs 100 crores be made in the accounts. The CFO of the health insurer is of the view that IBNR calculation is an estimate and actual claim cost of IBNR claims would be different. Therefore he suggests that a provision of Rs 99 crores should be reasonable.
- (ii)** Discuss how you would respond to CFO's suggestion. (5)
- [10]**
- Q 4)** You are pricing a standalone critical illness product which provides lump sum benefit on the incidence of Cancer.
- The Marketing Director of your company, in one of the product review meetings while discussing this product, opines that the purpose of critical illness product is to cover the loss due to incidence of illness and hence suggests that survival periods should not be insisted.
- (i)** List the points that you would put forth to explain the relevance of survival periods in a standalone critical illness product. (4)
- The Appointed Actuary asks you to price an accelerated critical illness rider providing lump sum on the incidence of cancer. This rider will be attached to your existing term products.

- (ii) Explain how you will adjust the incidence rate for each illness for overlaps while deriving the risk premium rates for a CI product and write down and explain the formula that you will use to derive risk premium rates from the incidence rates of all the illnesses covered under an accelerated critical illness product and a stand-alone critical illness product. (6)  
[10]
- Q 5)** (i) Explain the term “Free cover limit” in group insurance (1)  
(ii) List the factors that you will consider while setting free cover limit for a takeover scheme (i.e. a scheme that has been insured with another insurer last year but being considered for insurance by your company). (4)  
[5]
- Q 6)** You are assisting your pricing actuary in pricing health benefits for group schemes. Explain the steps that you will follow to calculate risk premium rate for a group health insurance scheme for which you have exposures and claims experience for the past 5 years. [10]
- Q 7)** You are an actuary in a life office writing long term health products including critical illness and long term care. You are asked to review the risks posed by such contracts to the company.
- (i) Explain how morbidity deterioration assumptions will be considered in the  
(a) the derivation of incidence rates  
(b) in pricing the products  
(c) in the provision of rate guarantees under long term critical illness contracts. (10)
- (ii) Discuss the advantages and disadvantages of the reviewability of premium rates from the perspective of the policyholder and of the insurer. (5)  
[15]
- Q 8)** The Chief Risk Officer (CRO) of the company in which you are an actuary brings to your notice a recent article on mis-selling and “rampant” (as the article quotes) claim repudiation under long term health contracts. The article goes on to point out that insurers fail to underwrite when an application for insurance is submitted but underwrite only when claims are submitted. The report singles out this practice as the reason for “rampant” claims repudiation under such contracts. The CRO seeks your assistance in writing a brief report on the effect of underwriting in long term health contracts.  
Discuss the issues on underwriting health contracts (both initial and claims underwriting) that you would include in your report to the CRO. [12]

- Q 9)** You are a pricing actuary who is in the process of finalizing a reinsurance arrangement for a long term health product providing hospital cash benefit, cover for major surgeries and critical illnesses.
- (i)** List down the factors that will influence an insurer's decision on reinsuring a health product. (4)
  - (ii)** While making a decision on the type of reinsurance arrangement, you perceive a need for equitable sharing of risks on each contract but also avoid exposure to large cover amounts. Design a reinsurance arrangement that would meet the purpose of risk sharing. Also explain the reasons for proposing such an arrangement with advantages and drawbacks of the arrangement proposed by you. (5)
  - (iii)** You also wish to explore the option of using reinsurance as a source of financing. Explain how reinsurance could be used as a financing option. (4)
- [13]**

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