INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

29th May 2012

Subject ST1 - Health and Care Insurance

Time allowed: Three hours (14.45* – 18.00 Hrs)

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.*

7. *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.

Q. 1) The Government of Indiania provides free healthcare to all its citizens from birth to death. It is very concerned with ever increasing healthcare expenditure. The rate of increase of the expenditure has been much higher than the country's GDP growth and earnings inflation for many years. As an alternative to the free healthcare system the Government is considering introducing a healthcare savings scheme under which individuals set aside part of their income into personalized healthcare savings accounts managed by the Government to help co-pay their future personal or immediate family's medical expenses. The savings can be withdrawn to pay the hospital bills of the account holder and his immediate family members provided the patient stays in the hospital for at least 24 hours. There are limits on the withdrawals depending upon the treatment required. Under the new system, there shall be no health care available free of cost. However, the Government shall provide subsidies to keep the basic health care affordable.

a) Outline possible reasons for the increasing healthcare expenditure (4)

b) Discuss actions that the Government can take to encourage participation in the scheme (3)

c) Identify the gaps in the proposed scheme in terms of comprehensiveness of the healthcare provision compared to the existing free-for-everybody scheme and briefly explain how they might be addressed (4)

d) Describe briefly the factors that the Government should consider when deciding upon an investment policy for the scheme (4)

[15]

Q. 2) A health insurer has been writing only a Private Medical Insurance (PMI) product since the year 2005. The product has one-year pre-existing illnesses exclusion and a fixed term of three years.

a) Outline the reasons why the PMI product's claims experience may vary from that assumed in the premium basis.

You are provided with the following data. All claims reported as of 31.12.2011 have been included in the data.

Calendar Year	2010	2010	2010	2010	2011	2011	2011
	Q1	Q2	Q3	Q4	Q1	Q2	Q3
No. of Insured Lives (as at End of the quarter)	21,345	38,559	37,272	45,098	50,345	48,974	60,904
No. of Claims incurred during the quarter	547	925	1,087	1,987	1,345	1,296	1,234
Total amount Claimed during the quarter ('000)	13,254	21,974	33,673	67,073	34,253	34,703	40,053

The company has used an incidence rate of 2.5% per annum and average claim size of 27,000 in its pricing. (5)

b) Calculate the Actual to Expected claims (A/E) ratio for the calendar year 2010 and the expected A/E ratio for the full calendar year 2011. State any assumptions that you make.

The insurer has decided to re-price the product. (5)

c) Describe how you would go about setting the assumptions required to arrive at the expected claim cost per life per annum. (8)

d) Explain how you would calculate the embedded value of the insurer. You should list all the assumptions that are required to do the calculation. (6)

[24]

Q. 3) A health and care Insurance Company currently offers a hospital cash plan that provides the insured with a fixed benefit for each day of hospitalization. The policy requires a minimum stay of 24 hours in the hospital.

a) Outline the main product specific risks associated with such contracts for the insurer.

The Company is now considering changing some of the product features and re-launching the product. As part of the change, the company is planning to increase the minimum stay requirement to 48 hours. (3)

b) Discuss the pricing implications of such a change in the product design.

As an alternative to changing the minimum stay requirement, the company is considering introducing a 1 day deductible. (3)

c) Discuss the pricing implications of such a change in the product design. (3)

d) Discuss the factors to be considered in deciding on the change to the product design. (3)

[12]

Q. 4) An individual aged 40 years is planning to take out a health insurance policy. He intends to have a cover up to age 70 years. He has surfed the internet and found that one insurance company is operating in both life and non-life segment separately. Interestingly, the same health insurance plan features are available in both the segments (life and non-life) except the following differences:

- The Life insurance company offers contract for 30-years but the premium is reviewable every three years
- The Non-life insurance company offers guaranteed renewability till age 70 years but the contract is reviewable every year

He noticed that the premiums charged by the life and non-life insurance companies are quite different for the same type and amount of cover.

a) List possible reasons why the premiums differ. (3)

b) Outline the factors that should be considered by the individual in deciding whether to buy the cover from the life or the non-life insurance company. (3)

[6]

Q. 5) You are the Risk Management Actuary working for a health and care insurer which writes a critical illness product covering Cancer, Stroke and Heart Attack that provides an option to increase the sum assured by 10% every 5 years without underwriting.

a) Describe how you would allow for the increasing sum assured option in the calculation of reserves for this product.

The insurer has been distributing the product via a traditional agency channel. Additionally, it has now decided to distribute the product to air-passengers through air-hostesses. The air-hostesses will be remunerated on a commission basis. (3)

b) Describe the risks to the insurer associated with the new distribution channel and how they can be mitigated including any monitoring mechanisms that the insurer should put in place to manage the risks.

The insurer is planning to recruit staff for underwriting and claim management. You have been asked to prepare guidelines on underwriting and claim management to help the newly hired staff who have no prior experience in health insurance but have some experience in life insurance underwriting and claim management. (6)

c) Briefly describe the aspects that that you would cover in the guidelines.

The Marketing Director of the company suggests that HIV/AIDS to be covered as one of the critical illnesses with benefit being paid in the form of a life annuity. (5)

d) Comment on the suggestion. (6)

[20]

Q. 6) You are the Product Development Actuary for a well-established health insurance company that has been writing Income Protection, Critical Illness, Private Medical Insurance and Hospital Cash products for many years. You are now considering introducing Long Term Care Insurance (LTCI) products. As the product is new to the company your plan is to offer it a rider to the other products.

a) Discuss how well the LTCI rider fits with the base plan and list the desirable features of the rider benefit where the base product is a

- **i)** Critical Illness Insurance
- **ii)** Income Protection Insurance
- **iii)** Private Medical Insurance
- **iv)** Hospital Cash Insurance

You have received feedback on your initial pricing from the sales director of the company that the indicative premium is quite high and so the product will not sell. (12)

b) Describe the typical means of reducing the premium for a LTCI product and the associated risks. (7)

c) Outline how reinsurance can be used to mitigate some of these risks. (4)

[23]

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