INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

30th October 2007

Subject ST1 — Health and Care Insurance

Time allowed: Three hours (14.15* pm – 17.30 pm)

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer sheet.*

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. *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.*

4. *You must not start writing your answers in the answer sheet until instructed to do so by the supervisor.*

5. *Mark allocations are shown in brackets.*

6. *Attempt all questions, beginning your answer to each question on a separate sheet.*

7. *Candidates should show calculations where this is appropriate.*

8. *Fasten your answer sheets together in numerical order of questions. This, you may complete immediately after expiry of the examination time.*

Professional Conduct:

It is brought to your notice that in accordance with provisions contained in the Professional Conduct Standards, If any candidate is found copying or involved in any other form of malpractice, during or in connection with the examination, disciplinary action will be taken against the candidate which may include expulsion or suspension from the membership of ASI.

Candidates are advised that a reasonable standard of handwriting legibility is expected by the examiners and that candidates may be penalized if undue effort is required by the examiners to interpret scripts.

AT THE END OF THE EXAMINATION

Please return your answersheets and this question paper to the supervisor seperatly.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator.

Q. 1)

a) With the aim of affording protection to policyholders, governments usually impose restrictions on the way the insurance companies operate. State the most common types of regulatory restrictions that are imposed on health and care insurance business. (5)

b) There are various ways in which a Government may provide health care to its population. Compare the advantages of the Government providing health care through its own medical establishments with the Government making use of the commercial health care system. (3)

[8]

Q. 2)

a) Describe how new business strain can arise in the following two types of policies:

i) critical illness policies where level premiums are payable throughout the term of the policy

ii) immediate needs long term care insurance policies with single premium payable at the start of the contract. (4)

b) What are the disadvantages of writing capital intensive business (2)

c) Most of health and care insurance business does not involve financially crippling investment guarantees. Discuss this statement and give example of a health and care insurance contract which could pose significant investment risk to the insurance company. (3)

[9]

Q. 3)

a) Describe and briefly discuss the factors affecting different types of options in health and care insurance policies (5)

b) Experience rating applies to group private medical insurance policies and individual private medical insurance policies may provide no-claim discounts. Explain the two concepts, namely, experience rating and no-claim discount as they apply to private medical insurance policies and discuss in what respects they are similar and different. (5)

[10]

Q. 4)

a) List and define the different types of reserves held to meet the claim liabilities of a life insurer transacting individual non linked level premium critical illness policies. Also indicate, with reasons, the likely magnitude of the reserves. (5)

b) A life insurance company offers a unit linked product with term insurance and 100 % acceleration of term cover benefit on diagnosis of one of six specified critical illnesses. The costs of cover and charge for administrative expenses are not guaranteed for more than a year and will be recovered monthly by cancellation of units. The policy provides for a surrender value which will be the value of the unit fund, subject to a surrender penalty. Discuss the main risks to the company of this product.

(7)

[12]

Q. 5)

a) List the factors that might cause the future morbidity experience of new policyholders to differ from that of the company's historical experience data, for a particular health and care insurance product. (3)

b) In the context of setting assumptions for long term health insurance products such as income protection insurance, critical illness and long term care insurance, industry data may have more credibility than own company data but are less relevant. List the reasons for the same. (4)

c) In the case of income protection insurance and long term care insurance contracts where an income is payable, lot of time and high costs are involved in the servicing of claims. What are the main items of expenses for claims in payment under such policies. (2)
[9]

Q. 6)

a) As the actuary to a health insurance company, describe how you will analyse the claims experience of the private medical insurance portfolio of the business. The analysis will be limited to individual policies and will not cover group policies. (9)

b) List the reasons why the claims experience of the health insurance portfolio of two insurance companies can be significantly different. For this purpose you can assume that the portfolio consists only of income protection insurance. (5)
[14]

Q. 7) A life insurance company which has a substantial critical illness business on its portfolio is planning to launch a stand alone critical illness plan with term up to 25 years, under which the life assured will be re-underwritten after every 5 years.
At each re - underwriting, the policyholder may be

i) offered at standard rates depending on the then current health status or
ii) charged extra premium or
iii) refused cover.

Premiums are calculated to remain level throughout the term, provided there is no change in the underwriting status on re-underwriting.

a) Discuss the rationale of re - underwriting at the five yearly intervals. (4)

b) Comment on why a five year reviewable policy will be attractive to policyholders. (4)
[8]

Q. 8) ABC is a leading commercial bank in India which does not provide any medical or other health care benefits for her employees. Some of the members receive and pay for medical treatment with a few life insurance companies which offer medical insurance benefits and others do not have a formal medical insurance.

You are the pricing actuary for XYZ Life Insurance Company which also offers life and health insurance products to various corporate clients. During your discussion with ABC, you have decided to offer a voluntary group policy to ABC, which is a conventional non-profit medical expense insurance policy under which the premium and benefits are not guaranteed for the duration of the contract.

a. List the data sources normally available for pricing this line of business and indicate those which could and could not be available in the circumstance cited above. (5)

b. Briefly explain how medical underwriters seek to manage risk for this type of private medical insurance policy. (4)

c. Describe how a moratorium clause may be used to manage risk as an alternative to medical underwriting. (3)

d. Briefly explain the difference in the treatment towards medical underwriting for health insurance between group policies and individual policies. (4)

e. ABC is having about 100 executives whose medical history is not very comfortable as they suffer from one or other medical problems. As an actuary you clearly see that this group represents a higher risk than what is assumed in the pricing. List the options available to XYZ, if you have to accommodate these executives along with others. (4)

[20]

Q. 9) Moonlight Insurance Company provides individual income protection contracts with a deferred period of three months. Invariably, all benefits are payable monthly in advance.

On 1st January, 2006 the company had 10,000 policies with all policyholders aged 35 next birthday and the following distribution of benefits:

Sum at risk for each policy	No. of policies
Rs. 3.0 lakhs annual benefit	8000
Rs. 4.0 lakhs annual benefit	1500
Rs. 5.0 lakhs annual benefit	500

On 1st January, 2006, the company entered into a re-insurance contract which provides for a quota share of 75% of each risk which is ceded. The company retains the maximum of Rs. 1.0 lakhs benefit per annum per life. Risk premium rates – re-insurance rates are applied monthly to the sum at risk and the rate definition is ‘age next birthday at the previous policy anniversary’. All risk prior to January 1, 2006 is to be retained by the insurer. The following extract of the premium rate table is available:

Age next birthday	Annual premium rate per Rs. 1.0 lakh benefit (Rs.)
34	120
35	130
36	140
37	150

You are given the following extract from the insurance claim records.

Claim No.	Date of sick	Date claim notified	Date claim accepted	Date of recovery	annual benefit (Rs. In lakhs)
A	5 November 2005	12 December 2005	5 January 2006	4 June 2006	3.0
B	12 December 2005	17 January 2006	26 January 2006	11 July 2006	4.0
C	7 January 2006	18 February 2006	9 March 2006	6 August 2006	3.0
D	25 June 2006	13 August 2006	18 August 2006	24 August 2006	3.0
E	21 November 2006	6 January 2007	12 January 2007	20 March 2007	3.0
F	15 April 2006	4 February 2007	5 February 2007	14 October 2008	5.0

a. Calculate the re-insurance sum insured (2)

b. Assuming that 10% of the policies lapsed uniformly during the year, estimate the re-insurance premium for 2006. (2)

c. State with reasons whether the re-insurer was required to make payments for each of the above claims. (2)

d. Calculate the total amount of the claim payments made by the re-insurer in respect of these claims. (2)

e. State other factors the re-insurer would need to consider in order to determine the profitability of this business. (2)

[10]

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