Actuarial Society of India

EXAMINATION

16th May 2007

Subject ST2 — Life 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.

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

AT THE END OF THE EXAMINATION

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

Q.1 You are the Appointed Actuary to an established life insurer that has transacted with profits business for a number of years. Until now surrender values have been determined using a formula prescribed in Regulations that were drafted many years ago. You have recently received a Circular from the Regulator stating that it is proposed to revise the Regulation such that surrender values for policies from now on may be on a basis determined by the Appointed Actuary.

(a) What principles would you consider in developing a proposed basis? (4)

The Customer Service Manager has also received a copy of the Circular. She reminds you that policyholders have been seeking flexibility to alter their policies but until now the Regulator has not allowed this to be done. She believes it would be appropriate to raise the issue with the Regulator. You agree and decide to provide the Regulator with some examples.

(b) What principles would you consider in developing appropriate alteration terms? (4)

[8]

Q.2 You are the product development actuary of a company writing investment linked business to individuals spread across the country. Most policyholders choose an investment option called the Balanced Fund where the company has wide discretion in terms of the policy document to invest in a mix of, short and long term government bonds, corporate and equity shares. A mixture that consists of roughly equal proportions has been maintained for some years and the bonds consist of a mixture of short and long terms.

The marketing manager speaks to you and says the product range would be enhanced if the company were to guarantee that the benefit on surrender or maturity would be no less than the premiums paid. He doesn't think this should provide any difficulty as if necessary the company could change the investment mix.

(a) Why might the marketing manager believe this wouldn't cause any difficulty, and what is the relevance of the reference to the investment mix? (1)

(b) Draft a short response to the marketing manager summarizing your immediate reactions to the proposed way of dealing with the difficulty. (2)

A few days later you meet to discuss the matter face to face. The two of you agree to leave the existing products for now and instead design and price a new product. You state that these guarantees are a form of financial option. The marketing manager asks you to explain further.

(c) Describe why the guarantees are a form of financial option (1)

(d) Describe how financial option techniques help with valuing the cost of the guarantees (2)

The new product will have a ten year term and to comply with Regulations the minimum death benefit will need to be at least equal to ten times the annual premium. Premiums are fixed throughout the term of the contract. At the end of the term the marketing manager proposes that policyholders will be able to take their maturity proceeds in cash and effect a further ten year term product for a premium equal to the initial premium increased by inflation over the ten year period with no evidence of insurability required. The option would not apply at the end of the second ten year term.

(e) Explain the risks that arise as a result of the proposal, and the general approach you would take to allow for the risks in the pricing of the new product. (7)

(f) The company has a simple reinsurance program and in general reinsures all amounts of risk in excess of its retention limit. The average death benefit under this product is expected to be well below the normal retention limit. What modifications to the program might you consider in the circumstances? (3)

[16]

Q.3 You have been invited to apply for the position of Appointed Actuary in an established life insurance company that has recently been acquired by a successful large scale commercial venture. The life insurer writes with profits and unit linked business using a range of distribution channels This is the acquirer's first entry into life insurance and you have read media reports that state the promoters see big opportunities to expand the business. You are compiling notes before an interview with the directors and one of the headings you have written down is 'risk profile'.

(a) List factors that you think would might be relevant that would increase the company's risk profile as a result of the take-over. (4)

At the interview, one of the directors says he has heard that actuaries are subject to professional guidance. He asks you to explain this concept and why it has been adopted.

(b) Without going into specific aspects of guidance, what points would you make in your reply? (3)

The directors say they have an established systematic risk management program in their other businesses and ask you how you would see your responsibilities in relation to the life insurer.

(c) Identify the generic principles and methods you would mention in your reply. (6)

The meeting with the directors goes well and is followed by a short meeting with the finance director who is new to the life insurance business. In the context of controlling risk the finance director asks what operational information should be collected related to products and channels.

(d) Identify the important focus areas and explain the reasons why they are important. (10)

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Q.4 In the context of participating business where profits are distributed using an additions to benefit method:

(a) Explain the concept of policyholders' reasonable expectations and give examples of how these might be created. (3)

(b) Explain the concept of 'deferral of profits' and how the structure of alternative participation system brings this about. (5)

(c) From the separate perspectives of policyholder, intermediary and the insurer itself, comment briefly on the advantages and disadvantages of profit deferral. (4)

You are the marketing actuary of an insurer that has successfully written with profits business for many years. The marketing manager feels that the emphasis on with profits business gives the insurer a competitive edge but also feels the traditional products are somewhat out of date. He has returned from an overseas trip and noted the success of a new style of product - accumulating with profits. He asks you to summarise the key features of such products.

(d) Draft a brief note to the marketing manager in response to his request. (9)

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Q.5 You are an actuary employed by a leading international reinsurance company that is supporting a new company with limited actuarial resources in an emerging market. You have agreed to provide comprehensive assistance in designing and pricing the initial range of products.

You are invited to make a presentation to the company's management and you are adapting a standard template provided by your home office. One of your first slides is labeled 'profit signature'.

(a) What is a profit signature? (1)

The next slide is labeled 'profit criteria'.

(b) What is a profit criterion? (1)

(c) Identify and briefly describe the profit criteria would you include in the slide and mention any significant limitations of each. (6)

It becomes apparent that the company's chief executive officer did not appreciate the amounts of capital that would be required to finance new business were the company to develop as anticipated and this presents you with an opportunity.

(d) What is financial reinsurance? (2)

(e) Describe the two principal forms of financial reinsurance encountered in practice. (4)

(f) What is counterparty risk and what measures might a Regulator take to mitigate this risk? (2)

The meeting ends on a positive note but the chief financial officer has a final observation; he says that the extent of reinsurance envisaged is likely to be costly to the company. Not necessarily, you reply.

(g) Why might an international reinsurer be able to price a risk lower than a ceding company? (2)

[18]

Q.6 You are the Valuation Actuary of an established company with over 1 million policies in force both investment linked and with profits. The Appointed Actuary has asked you to review the data checking processes before the next statutory valuation.

(a) Why would data checks be the concern of the Appointed Actuary? (3)

(b) Identify the broad categories of data checks and provide an explanation for each. (11)

[14]

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