INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

5th November 2008

Subject ST2 — Life Insurance

Time allowed: Three hours (14.15* pm – 17.30 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 new life insurance company is contemplating using the revalorisation method to distribute surplus to policyholders for certain with profits contracts.

a) Explain how this method works (2)

b) Describe, with reasons, a suitable investment strategy that you would recommend the life company to follow for such products (5)

[7]

Q. 2) A life insurance company which has sold regular premium paying Unit Linked Products is contemplating changing the charging structure of this product to improve its profitability

a) Describe the key benefits and charging structure of a typical regular premium paying Unit Linked Product (6)

The suggested change in the charging structure is to introduce actuarial funding

b) State the conditions that have to be met for actuarial funding to be used, and any constraints there may be on the extent of its use (3)

c) Describe what the impact would be on profit flows as a result of using actuarial funding (4)

[13]

Q. 3) You are an actuary for a life insurance company which has sold a large volume of a term assurance product. The contracts pay a benefit on death during the policy term. If the death is as a result of suicide in the first policy year the benefit is not paid.

The company finds that the new business it has written over the last 12 months has declined. A meeting with the marketing director has been arranged to discuss and seek suggestions to address this issue. After detailed discussions it was felt that a reduction in premium rates may not be possible and hence measures which improve the marketability of the product need to be considered.

Discuss the principal risks / possible implications that the company faces in relation to the following suggestions

a) Revise the policy conditions so that the death benefit is paid if death occurs as a result of suicide at any point during the policy term (6)

b) Simplify underwriting by reducing the number of questions in the proposal form (6)

There was a third suggestion which was to introduce mortality options as these might provide a competitive edge.

c) State the common mortality options that the company could think of introducing (3)

The suggestion on mortality options was accepted and it was agreed to allow the policyholder an option to increase the sum assured on normal mortality rates without evidence of health.

d) Outline the conventional method for evaluating the value of a mortality option (2)

e) For a 5 year single premium without profits term assurance with an initial sum assured of Rs.10,00,000 payable immediately on death, an option is to be introduced such that the policy holder can increase the sum assured by Rs.5,00,000 at the end of the second year by paying an additional premium at that time. Calculate the additional single premium payable for the option by a life aged 55 at the outset using the North American Method assuming the following:

i.	Normal Mortality	AM92 Select
ii.	Mortality for non –option takers	AM92 Ultimate
iii.	Mortality for option takers	250% of AM92 Ultimate
iv.	Proportion of eligible policyholders who exercise the option	30%
v.	Interest	4% pa
vi.	Expenses	None

(10)

[27]

Q. 4) You are an actuary working for an expanding life insurance company and about to recruit senior actuarial students who are close to qualification in your team. You feel a suitable candidate would be someone who has a very good understanding of the risks usually faced by any life insurance company and who has kept pace with the developments in the profession.

a) The question you decided to ask the candidates is "Outline the risks which could have a material impact on a life insurance company's solvency and how those risks can be mitigated". What are the points you are looking for from the candidate in a comprehensive answer. (18)

b) One of the candidates in her CV has mentioned that she has experience of working on market consistent valuation of liabilities. During the conversation with her you ask the question "Explain how you might calculate a market consistent value of liabilities for a portfolio of conventional without profits immediate annuity policies". What are the main points you expect in the candidate's reply (7)

[25]

Q. 5) You are an actuary working for a life insurance company which writes only with profits contracts and has just closed to new business. You are required to calculate the realistic Embedded Value (not Market Consistent Embedded Value) of the company and present the results to the board. You understand that the assumptions underlying the calculations will be questioned / debated in the board meeting. Hence you want to take all the relevant factors into account before deciding on each of the principal assumptions.

Discuss the factors you would consider for the following assumptions:

a. Expense (6)
b. Withdrawals (4)
c. Investment returns (5)

[15]

Q. 6) Describe the aims and main features of a catastrophe reinsurance treaty from a ceding life insurance company perspective **[5]**

Q. 7) A life insurance company chooses to use Net Present Value as a profit criterion over other measures like the internal rate of return or the discounted payback period. Describe why the company might choose to do so **[8]**

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