INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

26th November 2012

Subject SA2 – Life Insurance

Time allowed: Three hours (9.45* - 13.00 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 expected to be India Specific application for the syllabus and corresponding core reading. However, substantially the core reading material is still taken from material supplied by Actuarial Education Company which are meant for UK Fellowship examination. The core reading also contains some material which is India Specific, mostly the IRDA regulation. In view of this, it should be noted that focal point of answers is expected to be India Specific application. However if application specific to any other country is quoted in the answer the same should answer the question with reference to Indian environment.

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) You are the Product Actuary of a life insurance company operating in India in 2012. Due to the current challenges facing the industry, new business volumes are down compared to last year. Your company's current product mix is 50% participating business, 30% unit-linked business and 10% non-participating savings business and the balance 10% non-participating protection business.

In discussions with your Sales Director you suggest to her that the product mix is currently not optimised for profitability and there are opportunities to do so. One such idea you propose is to consider increasing rider sales.

[i] What conditions are required to be met for a life insurance product to be eligible for a tax deduction under Section 80C and for the claim proceeds to be exempt from taxation under Section 10(10D) of the Income Tax Act, 1961, as amended in the Finance Act, 2012? (2)

[ii] State the regulations and the constraints applicable to the design of riders in India, and their principal consequences. (5)

Your colleague, the Company's Valuation Actuary, has prepared an analysis of surplus of the statutory profits for FY11/12. The analysis of surplus for the Participating line of business is set out below.

Participating Business, Figures in Rs Crore			
Sources	**Expected Profit (E)**	**Experience Profit (A-E)**	**Actual Profit (A)**
Mortality	20	10	30
Persistency	25	30	55
New business impact	0	-25	-25
Costs (Expenses and Commission)	30	10	40
Investment	25	5	30
Assumptions/methodology	0	50	50
Total Participating Business	**100**	**80**	**180**

The Valuation Actuary has made the following observations on the analysis of surplus:

- the actual lapses for Participating business for the year were higher than the level assumed in the statutory reserving basis;

- the actual mortality experience for the year was lower than the level assumed in the statutory reserving basis;
- the reserving maintenance expense assumptions were reduced during the year. No other assumptions were changed during the year.

[iii] You are asked to provide a commentary on the participating business performance for FY11/12 based on the analysis of surplus. Discuss the issues to be addressed in your response in particular the following questions:

[a] From the analysis of surplus the Company has clearly done well on persistency however, the actual lapse experience seems to be higher than the reserving assumptions. What might cause this outcome and should the company alter its focus on persistency?

[b] What is the impact on interest rate risk and expense risk due to higher lapses for Participating business? (10)

[iv] Comment on the aspects you would consider in determining the level of sustainable experience profits that could be generated from participating business. (5)

You are considering designing a new product with both life insurance cover and a savings element. The Sales Director asks you the pros and cons of designing such a product on the participating and non-participating product platforms covering all relevant aspects including customer and distributor attractiveness, profitability and risk management.

[v] Discuss your response considering all aspects of product design including the relative advantages and disadvantages of participating and non-participating structures. You can ignore unit-linked designs for this purpose.

Your Company has launched several products in the last few months and you are concerned about the level of operational risk this is adding to the Company. In particular the Company has launched a new non-participating product with a new option for policyholders to choose an "inflation protector" that provides for a 5% or 10% increase in the annual premium and sum assured. The additional premiums received in the future are treated as new business for purposes of commission payments. (20)

[vi] Define operational risk. (2)

[vii] Describe the various elements of operational risk that the Company may be exposed to due to the recent product introductions including specific reference to the new non-participating product. List additional controls that may be deployed to mitigate such operational risks. (6) **[50]**

Q.2) You are the Appointed Actuary of a life insurance company which has been operating in India for more than 9 years. The insurer has an in-force book and has been continuing to write a significant volume of participating, non-participating and unit linked business. The insurer is a joint venture between a major multinational insurer and an Indian Bank. Each of the partners has its representation on the Board of the Directors of the insurance company.

The company calculates its embedded value annually, using a traditional deterministic calculation approach. One of the directors is concerned about the investment of the policyholders' fund into the corporate bonds.

[i] Describe how the company could allow within its (traditional) embedded value calculation for credit risk on corporate bonds, for assessment of the assumed return on the assets backing the liabilities. (6)

[ii] Outline how your projection assumptions for the EV would differ from the assumptions used to set supervisory reserves. Comment briefly on the consequence of the differences between reserving and EV assumptions. (8)

[iii] Outline the main elements that the company would include in an analysis of change in embedded value. (8)

The company is required to publish its embedded value results and share with the overseas JV partner before completion of its regulatory solvency returns. Last year, you decided to change the statutory valuation basis for conventional without profits immediate annuities after the embedded value had been shared with overseas JV partner. Although, actual investment yields were unchanged, you decided to strengthen both the valuation rate of interest and the mortality assumption.

[iv] Describe how each of these changes might affect the embedded value.

Having seen the results of the most recent year's analysis of change, the CFO has noticed a significant adverse experience variation due to persistency. He has suggested that the assumptions used by the company in calculating embedded values in future should be moved in line with this experience. (8)

[v] Discuss the issues the company would need to consider before making such a change.

The CEO of the company is from banking background. He mentioned that bankers are usually concerned about liquidity risks and he would like to know about the liquidity position of the company. (6)

[vi] Define liquidity risk in the context of life insurance. (1)

[vii] Describe how you would assess the Company's liquidity position mentioning any special issues for the various lines of business and any stress testing that you would consider.

In a recent Risk Committee meeting, one of the directors representing the overseas JV partner noted that the sales of the immediate annuity business is picking up and is concerned about the possible mismatch risk in this line of business. (6)

[viii] Describe the purpose of asset liability management (ALM) and discuss the issues that arise with an immediate annuity portfolio (7) **[50]**

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