INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

3rd May 2016

Subject SA2 - Life Insurance

Time allowed: Three hours (14.45* - 18.00 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 you are required 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 is 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 candidate 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 work as a Valuation Actuary in an Indian life insurance company.

i) State the requirements of APS-3 in relation to the contents of a Financial Condition Report for a life insurance company. (6)

The Company has been operating for over 15 years. It writes business through bancassurance and tied individual agency distribution channels. Over the last few years, the bancassurance channel has been contributing about 60% of the new business volumes, with the tied individual agency channel contributing the rest. The Company writes a diversified mix of products including participating, non-participating and unit-linked.

At a recent With-Profits Committee ("WPC") meeting, the committee members observed that the estate in the Company's participating fund has grown significantly over the last few years. The WPC has asked you to investigate into the matter and explain to them the drivers of the increase in the estate.

ii) Discuss how you would perform your investigation to identify the various factors that could have strengthened the estate of the Company's participating fund.

Note: You may assume that the statutory liabilities of the participating fund are broadly equivalent to the aggregate of the policy-wise asset shares of participating policies plus the reserves for participating policies that became reduced paid-up upon discontinuance of premiums. (24)

The Company is planning to upgrade its IT infrastructure including implementation of a new policy administration system, replacing its legacy system. The estimated cost of the upgradation is about one-fifth of the size of the estate of the participating fund. The Chief Financial Officer has asked you whether the Company can allocate a part of the upgradation expenditure to the participating fund.

iii) Discuss the various aspects you would consider in order to evaluate the reasonableness of the CFO's suggestion. (12)

iv) For the participating business in India, briefly discuss various safeguards implemented by the regulator to protect the interests of the participating policyholders. (8)

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Q. 2) i) What are the main objectives for carrying out asset-liability management (ALM) studies for life insurance companies? (2)

An Indian life insurance company has a large portfolio of a non-participating anticipated endowment (i.e. 'money back') product that it has been selling for a number of years. Under this product, premiums are payable for 10 years. At the end of the premium payment term, survival benefits are paid in the form of an annuity over the subsequent 15 years. In case of death of the policyholder at any time during the policy term, a fixed lump sum is paid out and the policy terminates. The product also offers a surrender value in case of discontinuance, in line with the current regulations.

The Company invests premium proceeds in a portfolio of fixed income assets comprising government and corporate bonds and a small amount is held in money market instruments to meet liquidity needs. There are no other investments in any other asset classes other than those described above.

ii) State, in the context of the above product, the requirements as prescribed by the IRDAI, for carrying out ALM and stress testing exercise for life insurers operating in India. (6)

iii) You have been asked to undertake a cash-flow matching exercise to study the asset-liability matching for the in-force portfolio, and recommend any changes to the investment strategy, as may be necessary. Set out, with appropriate explanations, the considerations to be adopted in deciding a suitable set of 'best estimate' assumptions that can be used for performing the required cash-flow matching exercise. (16)

The Company also has a block of in-force business wherein an additional option was provided to policyholders at the end of the premium payment term of 10 years as described below:

a) Option A - Continue with the original product features and receive fixed annual annuity pay-outs over the subsequent 15 years; or

b) Option B - Forego the fixed annual annuity payments in lieu of a variable benefit payable as a lump sum at the end of subsequent 15 years. This variable benefit shall be calculated in the following manner:

- At the end of each year after the premium payment term, the Company shall declare an annual crediting rate, expressed as a percentage of total premiums paid.
- The annual crediting rates declared shall reflect the investment return earned by the Company over the year, less a deduction for an investment management charge by the Company.
- The variable benefit accrued every year would be equal to the annual crediting rate so declared multiplied by the total premiums paid by the policyholder.
- The total variable benefit payable at the end of the policy term shall be equal to total premiums paid plus the sum of annual variable benefits accrued over the 15 years following the end of the premium payment term, based on the crediting rates declared.
- A minimum guarantee is offered that the crediting rates (net of investment management charge) shall be declared such that the maturity benefit payable under Option B would be at least equal to the sum of the fixed annuity that would have been paid under Option A.

iv) Describe in detail the model that the Company should build to calculate the cost of the policyholder options and investment guarantees under Option B (you may ignore any guarantee charges, as there will not be any explicit charge for the guarantee). (16)

v) Discuss the various checks that should be carried out on the model developed? (10)

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