INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

9th November 2011

Subject CA1 – Actuarial Risk Management (Paper II)

Time allowed: 3 Hours (14.45* - 18.00 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. ***Attempt all questions, beginning your answer to each question on a separate sheet.***
3. ****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 3 hours to complete the paper.***
4. ***You must not start writing your answers until instructed to do so by the Supervisor.***
5. ***Mark allocations are shown in brackets.***
6. ***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) **i)** State the objectives of catastrophic reinsurance. (2)

ii) Outline the main features of catastrophe reinsurance. (4)

[6]

Q. 2) **i)** State the 3 main methods used to fund benefits. (1)

ii) Discuss the factors that would be taken into account when deciding on how to fund benefits under a defined benefits pension scheme. (5)

[6]

Q. 3) A general insurance company has recently been experiencing deterioration in the loss ratios relating to its motor business. It is believed that this is due to an increase in fraudulent behavior by policyholders.

Describe the steps the company could take to reduce the effects of such fraud.

[8]

Q. 4) You have recently conducted an analysis of surplus arising during the last financial year for a life insurer. A significant source of surplus is the surrender profit.

i) Outline the principal reasons why the company may have experienced such high surrender profits. (4)

The Chief Actuary feels that surrenders should be valued stochastically considering the financial significance of any variation in assumption.

ii) Discuss the advantages of stochastic model over deterministic model for this task (4)

[8]

Q. 5) Insurance companies operating in a developing country offer only unit linked personal pension products on an individual basis with no benefit guarantees.

The product life cycle has 2 phases- the accumulation phase and the annuity payout phase.

On death of the policyholder during the accumulation phase, unit fund balance is paid to the dependent.

On vesting date, the unit fund balance available needs to be compulsorily invested in purchasing an annuity from any of the insurers operating in the market.

i) State the benefit risks faced by the policyholder in respect of the unit linked personal pension product offered by insurers. (3)

ii) In order to develop the pension market the insurance regulator of that country is considering standardization of benefit structure as follows:

- Provide a minimum guaranteed investment return of 3% pa during the accumulation phase - contribution less all charges are guaranteed to grow at this rate till date of death of the policyholder or vesting date whichever is earlier.

- Give an option to policyholders or to the dependent on the death of the policyholder, to take in cash up to 1/3rd of unit fund balance available on the date of vesting or death as applicable. The unit fund balance remaining has to be utilized to purchase a life annuity.
- The annuity can only be purchased from the same insurance company as that which manages the accumulation phase of the product.

Describe the advantages and disadvantages of the proposed changes for policyholders. (6)

[9]

Q. 6) **i)** Outline the factors that should be considered when setting bonus rates for with profit products. (5)

The Chief Actuary of a life insurance company is responsible for determining and recommending an appropriate level of annual bonus for the company's with profit business. However any proposal must be approved by the Board of Directors

ii) Discuss the major points that would be contained in the information supplied by the Chief Actuary to the Board in order for them to grant the necessary approval. (5)

[10]

Q. 7) The government of a large developed economy is planning to commence issuing long term Index-Linked bonds. Initially, the number of bonds will be relatively small but the government has indicated that they are willing to issue more such bonds in the future.

i) Outline the possible aim of the Government in issuing such Index-Linked bonds. (3)

ii) Set out the broad criterion for selection of an index to measure the inflation rate to be applied for indexation? (3)

iii) State why it might be necessary to have some time lag for indexation. (2)

iv) Describe the factors, which could influence likely demand for these Index-Linked bonds from the following investors:

a) Traders in the financial markets

b) Commercial/investment bankers

c) Life insurance companies (6)

[14]

Q. 8) A multinational commercial bank which caters to high net worth individuals has received the following proposition from a well-established life insurer which currently has a tied agency distribution model.

The bank will enter into 10 year distribution agreement with the insurance company. For each sale it will be compensated by maximum commission as allowed under existing regulations.

In addition, the bank will share in the profits of the business procured by it, because the insurance company will make an upfront profit share payment of Rs X Million, calculated as the present value of 20% total commission expected to be paid over the 10 years based on certain premium targets as agreed between the two players.

At the end of 10th year, if the agreed premium targets are not achieved then the life insurance company shall retain the right to claim a proportion of the upfront payment from the bank.

Discuss the factors the bank will take into account when assessing this proposal.

[16]

Q. 9) The pension Regulator of a large country with a large number of private sector defined benefits schemes is concerned that an increasing number of such schemes are winding up and facing the risk of insolvency such that members benefits are at risk.

They have decided to set up an “Insolvency Pension Fund”(IPF) which would take on and manage the assets and liabilities of insolvent pension schemes. Schemes that are taken on by this fund would be wound up and closed to new members and existing active members would only be covered for benefits accrued to the date of winding up. Future accruals could accrue under alternative arrangements but the IPF would take on liability for deferred pension and pensions in payment.

All existing private sector defined benefit schemes would pay an annual levy to the IPF, which is designed to be self-financing. The assets of the IPF will be managed as a single entity with a single strategy.

i) Outline how the main parties involved would be affected by the introduction of the levy? (6)

ii) List the circumstances where an actuary advising the IPF on the level of the levy to be charged may face a conflict of interest. (2)

iii) Describe how such conflicts could be managed. (3)

iv) Discuss the factors that should be considered when determining the levy each scheme should pay? (4)

v) Explain the considerations that would influence the investment strategy adopted by the IPF. (8)

[23]

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