

# INSTITUTE OF ACTUARIES OF INDIA

## EXAMINATIONS

27<sup>th</sup> April 2016

### 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 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 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)** What are flexible benefit schemes? (2)
- ii)** Explain the advantages and disadvantages of having a flexible benefit schemes to the employer. (4)

[6]

- Q. 2)** Discuss the advantages of using a stochastic model compared to a deterministic model to set up provisions for a unit linked product which gives a guaranteed maturity benefit. [6]

- Q. 3) i)** List the benefits of reinsurance to an insurer? (4)
- ii)** Under a surplus treaty, the estimated maximum loss and retention limits chosen for 2 properties are as follows:

Property	Estimated Maximum loss (EML)	Retention Limit
Property 1	100,00,00,000	40,00,00,000
Property 2	15,00,000	5,00,000

- a)** Calculate the percentage of risk retained by the insurer for each of the above 2 properties. (1)

- b)** The following claims are received for each of the risks:

- 1) Property 1: claim for 50,00,00,000
- 2) Property 2: claims for 17,00,000 & 100,000 respectively

Calculate the reinsurance recoveries on each claim under the surplus treaty above. Comment on the treatment of claim received on Property 2 by the reinsurer. (4)

[9]

- Q. 4)** A proprietary life insurance company predominantly writes with profit endowment assurance contracts with a reversionary bonus structure.

- i)** List the possible sources of surplus/deficit. (4)
- ii)** In a year there is a huge surplus due to sale of an investment property. Discuss the factors to be considered in distribution of this surplus. (8)

[12]

- Q. 5)** A leading tour operator specializes in organizing group foreign tours exclusively for senior citizens.

- i)** Discuss the various risks faced by the tour operator. (7)
- ii)** The operator has approached a general insurance company for a customized product, which would meet all their insurance needs. What factors need to be taken into account, while designing a suitable product and its pricing? (7)

[14]

- Q. 6)** Insurance regulator in a country is planning to change from existing factor based supervisory capital model to an economic capital model.
- i)** List the advantages and disadvantages of the proposal. (6)
  - ii)** A life insurance company sells products covering longevity risks. Explain how the economic capital position can be assessed for this portfolio. (10)
- [16]
- Q. 7)** A general insurance company, currently a leader in property insurance, is looking into entering the liability insurance business as a means of diversification of its portfolio.
- i)** List the main types of liability insurance. (3)
- A major motor manufacturer has asked for a quote from the insurance company for covering risks relating to product liability.
- ii)** What information would you advise the company to obtain from the motor manufacturer to arrive at the premium rate? (5)
  - iii)** Discuss other factors that need to be considered before finalizing the premium rate. (9)
- [17]
- Q. 8)** The Pension fund trustees of a large public sector company have approached an actuarial consulting firm for advice. The current scheme is a defined benefit scheme, with pension based on the final salary. The employer is proposing to move into a defined contribution scheme.
- i)** List the advantages of a defined contribution scheme over a defined benefit scheme for the employer and employees. (8)
  - ii)** The employer is proposing to discontinue the Defined benefit scheme for future new entrants. Future benefit accrual for existing employees will also cease. As on the cut-off date, the benefits accrued for the existing employees from the Defined benefit scheme will be frozen and all future contributions shall be put into the new Defined contribution scheme. Discuss the factors you will consider as an actuary, in calculating the Defined benefit frozen liability. Explain all the assumptions you will need for arriving at the liability. (12)
- [20]

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