

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

5th September 2018

**Subject CA1 – Actuarial Risk Management
(Paper I)**

Time allowed: 3 Hours (14.45* - 18.00 Hours)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

- 1. Please read the instructions inside the cover 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. You are not allowed to carry the question paper in any form with you.

- Q. 1)** A large institutional investor is planning to buy shares in an overseas company Echo Ltd. one of the biggest luxury car manufacturers in the world. Discuss the factors that could influence the investor's decision. [5]
- Q. 2)** The management of a medium size health insurance business transacting health reimbursement business is reviewing the company's investment principles and strategy. Outline the factors the management should consider when determining the investment principles and strategy. [6]
- Q. 3)** i) Define the term equity risk premium (ERP). What would be the key components of ERP? (3)
 ii) List reasons why you would expect ERP to be lower than Property risk premium? (3) [6]
- Q. 4)** i) Define "information asymmetry" (2)
 ii) Explain one example each of information asymmetry that exists:
 a) In a general insurance contract (2)
 b) In a life insurance contract (2)
 iii) Outline the tools available to regulator of a financial sector to reduce impact of information asymmetry on retail customers. (4) [10]
- Q. 5)** A general insurer uses the third party vendors for the following functions :
 1) A third party agency for data entry, policy printing and despatch of documents to policyholders
 2) External actuarial firm for performing all reserving exercises
 i) Outline the risks that the insurer faces from outsourcing each of these activities. (6)
 ii) Describe the mitigation measures that the company could put in place in order to reduce the risk from third party vendors. (6) [12]
- Q. 6)** Discuss the characteristics and suitability of the following investments for a medium size life insurance company transacting with profit business. Assume these investments will pass regulatory scrutiny.
 i) Providing capital of Rs. 250 Mn to team of college graduates seeking to develop web based service for restaurant search and food delivery (6)
 ii) Investing in convertible debt of Rs. 250 Mn in a medium sized solar energy company offering solar system design, installation and maintenance services, through a private placement (6) [12]
- Q. 7)** An employer is considering implementing one of the following pension plan designs:
 Option 1: A plan which is a combination of a Defined benefit (DB) and Defined Contribution (DC) structures. Up to certain level of salary limit, pension is a traditional final pay defined benefit and salary above that limit is covered by a DC structure.

At retirement, a member will receive a defined benefit earned under the DB structure. The proceeds of the DC portion, if any, can be taken as a lump sum or converted to a life time annuity based on terms offered by the employer.

Option 2: A plan in which the employer pays a fixed contribution toward a DB scheme, but the defined benefit may change periodically based on the funded status of the plan.

Describe the risks of each design from the perspectives of the employer and its employees. [15]

Q. 8) A mutual fund has decided to offer a property fund for subscription. There will be a lock in period of 3 years after which units can be bought and sold at price quoted by the fund manager. The fund will close after a period of 7 years and remaining units, if any, would be bought back by the fund manager. The minimum subscription amount would be Rs. 5 Million and maximum Rs. 100 Mn per investor and it will be targeted at HNI customers. The objective of this fund is to invest in property companies solely involved in building residential apartments in major metro cities.

- i) Explain the advantages and disadvantages to customers investing in this product. (6)
- ii) Discuss the main risks that the mutual fund faces and the ways these risks may be mitigated. (10)

[16]

Q. 9) A medium size life insurance company selling primarily with-profit individual business is evaluating the guarantee cost in its existing business. Currently, the company uses deterministic model to calculate guarantee cost based on set of adverse scenarios. You are a student actuary in the company entrusted with the task of developing a stochastic model for this purpose.

- i) Describe why a stochastic model is preferable over a deterministic model to calculate the guarantee cost. (5)
- ii) The Chief Investment Officer has proposed increase in equity exposure in the with profit fund from the current 10% to 30% to improve returns to policyholders. You have been asked to prepare a note explaining the factors that need to be considered before taking a decision. Discuss the factors that need to be considered. (13)

[18]
