

# INSTITUTE OF ACTUARIES OF INDIA

## EXAMINATIONS

**26<sup>th</sup> June 2019**

**Subject CP1 – Actuarial Practice  
(Paper A)**

**Time allowed: 3 Hours 15 Minutes (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. Mark allocations are shown in brackets.*
- 4. 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)** List the factors that increase the risks in a financial product design. [3]
- Q. 2)** Outline how the following technologies can be used in pricing.
- i)** Telematics in Motor insurance. (2)
  - ii)** Wearables in Health insurance. (2)
- Q. 3)** **i)** Explain the term “global provisions” with a suitable example. (2)
- ii)** Outline the principal reasons for keeping global provisions. (2)
- Q. 4)** List the insurance needs of a large oil drilling company. [5]
- Q. 5)** You are the CEO of an automobile manufacturer that owns and occupies large area of land in a sub-urban area. A property developer has made an offer to purchase the land and proposes to develop it as a residential cum commercial complex.
- Outline the factors that you would need to take into account in deciding whether to recommend the offer to the shareholders. [6]
- Q. 6)** In a country, the insurance regulator has recently introduced risk based solvency regime, which requires changes in methodology of valuation of supervisory reserves. A life insurer uses an Actuarial Software, XYZ Expert Model, for all its actuarial calculations. It has been approached by a domestic vendor selling an off the shelf actuarial package specifically designed to cater to the new solvency regime.
- Discuss the merits of the company adapting existing model for performing calculations required under the new regime compared to purchasing the new actuarial software. [7]
- Q. 7)** A Senior Actuary has asked his student to examine the regulatory returns of other insurers and provide a comparative analysis of supervisory reserves it has set for its Health Indemnity business to other insurers’ reserves.
- i)** While providing response to the Senior Actuary, comment on the care the Student needs to take when using external data for comparative purposes. (4)
- In order to strengthen the process of setting up supervisory reserves, the Student has also been asked to prepare a process document covering the entire work.
- ii)** Describe the major areas that the Student needs to cover in the process document. (7)
- Q. 8)** A large general insurer is planning to introduce a new product covering cyber risks and expects good demand for the product.
- The product will provide cover to companies against financial losses arising from failure of company’s information technology systems. The Chief Actuary of the insurer has

[11]

recommended that the company put in place a comprehensive reinsurance arrangement for the new product and his proposal is as follows-

1. Quota share agreement with 15% retention
2. Excess of loss arrangement to protect net retention

i) State the reasons behind the Chief Actuary's recommendation. (5)

The Finance Director has reservations in ceding the risks to a re-insurer as the onus ultimately lies on the insurance company itself if the reinsurer defaults.

ii) Do you think the concerns raised by the Finance Director are valid and why? (2)

iii) What factors should the insurer consider when assessing the credit worthiness of a reinsurer. (5)  
[12]

**Q. 9)** An insurance company sells a unit linked pension product where it offers lifestyle option (where the Company shall invest on behalf of the customers in various asset classes based on a pre-determined formula which is age dependent) as well as self-select option (where customer selects asset classes he wants to invest in). The funds at retirement are used to purchase a level annuity at retirement at the terms then available.

i) What are the risks to the insurance company from offering lifestyle option? (3)

ii) Describe the considerations that should be taken into account in determining the investments that will make up the lifestyle option. (6)

The insurance company has decided to invest in both equities and bonds for lifestyle option.

iii) Discuss how the insurance company can use risk budgeting techniques to control the overall risk in the investment portfolio. (5)  
[14]

**Q. 10)** A mid-sized life insurance company operating in domestic market for last 8 years sells largely non-participating endowment business. The senior management has requested you to conduct detailed expense analysis.

i) Describe how the expense analysis should be performed. (6)

ii) How the results of this analysis could be used in setting premium rates for new products. (3)

The insurance company is planning to come up with new online Critical illness product with minimum sum assured of Rs 10 lakhs.

iii) Describe the additional considerations to be taken into account when setting per policy expense assumptions for a Critical Illness product. (7)  
[16]

- Q. 11)** A private aerospace company “Space ABC” which is currently in the commercial business of delivering pay loads into Earth’s orbit has recently launched a project to develop reusable satellite launch vehicles. It wants to complete the project by end of year 2022.
- i)** Discuss the major risks associated with this project. (10)
  - ii)** Suggest ways by which each of the risks identified in part (i) might be mitigated. (8)
- [18]**

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