INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

6th September 2016

Subject CA1 – Actuarial Risk Management (Paper I)

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

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.

Q. 1) List the criteria for a risk to be insurable **[4]**

Q. 2) A life insurer that started its operations two years ago has been predominantly selling term assurance business. The insurer now feels that its exposure to mortality risk is high. As term assurance portfolio is the company's main source of new business, it does not contemplate withdrawing from the market and intends to continue sale of these policies.

Outline ways in which the company can manage its exposure to mortality risk. **[5]**

Q. 3) An equity mutual fund manager managing a medium sized fund has been given the following investment mandate-

80%-100% equity

0%- 20% Cash

List the possible reasons for such a mandate. **[5]**

Q. 4) **i)** Write down the equation for determining the expected return and required return for the following asset classes

- Government Bonds
- Index linked Government Bonds
- Equity
- Property

(4)

ii) Explain the circumstances in which property yields may exceed yields on conventional government bonds (3)

[7]

Q. 5) **i)** Outline the steps necessary to deal with the risks facing a capital project (6)

ii) The government is planning to build a railway station in a small town which has a very famous temple and attracts many thousands of pilgrims every day. The station is proposed to be built by acquiring land from factories in the town that have been closed down. Currently the town is connected only by road and the nearest railway station is about 70 kms away. There is no airport in the town. It is expected to cost about Rs. 8 Billion to build the station which would be financed in a public private partnership.

a) Describe 4 major risks facing the project (4)

b) Describe how each of the risks you have identified would be mitigated (4)

[14]

Q. 6) An established general insurance company writes marine hull and marine cargo insurance only.

i) Define what is meant by a rating factor? (1)

ii) Give examples of perils that could be covered under a marine hull and marine cargo insurance policy (2)

iii) List some important risk and rating factors for marine hull and cargo insurance? (2)

iv) Discuss the business risks to this company in offering the marine insurance products. (13)

[18]

Q. 7) **i)** State and describe four theories that explain the shape of the yield curve. (4)

ii) Briefly describe the factors that could lead to a differential in the Gross redemption yield between a Government security and a corporate bond of same term (4)

iii) A large cement company has issued conventional corporate bonds of 5 years term where the yield is 3% higher than for a corresponding government bond.

Discuss the factors that

- A general insurance company selling motor, property business, and
- A life insurance company managing a large annuity portfolio

Should take into consideration while buying this bond. (10)

iv) A recent regulatory change allows a corporate bond to be valued at only 90% of its amortized book value for solvency calculation purposes. Earlier it was 100%.

Discuss how the decision to buy the bond could change in light of this recent regulatory change. (4)

[22]

Q. 8) **i)** A medium sized health insurance company, selling indemnity based hospitalization policies, found through its annual investigation that the business is not profitable.

Outline the various measures/actions the company can take in such a case and discuss the impact of those measures/actions. (15)

ii) The Company is planning to introduce a fixed benefit critical illness product which provides a lump sum benefit on being diagnosed with a Critical Illness. Discuss how existing data relating to its indemnity product could be used to price the critical illness product. (5)

iii) The Marketing director has suggested that existing health product customers of the company should be offered a 10% premium discount if they buy the new critical illness product to ensure the success of the product. Discuss issues to be considered before offering such a discount. (5)

[25]

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