INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

29th October 2009

Subject CA1 – Core Application Concept (Paper I)

Time allowed: 3 Hours (9.45* - 13.00Hrs)

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.*

AT THE END OF THE EXAMINATION
Please return your answer book and this question paper to the supervisor separately.

Q 1) Outline the principal risks associated with a portfolio of debt securities. **[4]**

Q 2) You have been asked to value an office block that was built 30 years ago. The office block was let on a 25-year lease which now has five years remaining. The rent actually being received is substantially in excess of the rack rent.

a) Define the term "rack rent". (1)

b) State the formula that you would use to value the property, defining all its parameters and listing any assumptions you would make. (2)

c) State, with reasons, the benchmark interest rate that you would use in determining the valuation rate of interest. (1)

[4]

Q 3) List the advantages and disadvantages of investing in equities via collective investment vehicles for

a) an individual investor;

b) an institutional investor.

[4]

Q 4) **a)** Define Economic Capital and the basis of determination for it. (2)

b) Outline the key components of an Economic Capital balance sheet. (1)

c) Explain VaR and Tail VaR in the context of the Internal Capital model of an insurance company. (3)

[6]

Q 5) **a)** Define the Terms -

i) Strategic risk

ii) Structural risk

iii) Active risk

in the context of asset management. (3)

b) A defined benefit pension fund has total assets of Rs 500 crores. Based on the actuarial valuation of the scheme liabilities the trustees have been advised that 70% of the fund liabilities are salary linked and the balance are fixed in money terms. The trustees have finalized the following investment policy- 50 % in equity investments, 30% in property investments and the balance in bonds of 20 year duration. The strategic benchmark is 80% domestic equity and 20% domestic bonds. Further, the fund manager to the scheme has been directed to manage the equity investments "actively" and to manage the bond portfolio "passively" (relative to a chosen bond index).

Describe the risks inherent in this investment strategy. (4)

[7]

Q 6) As an investor you have the following views-

Equity risk premium	3%
Property risk premium	3.25%
Inflation risk premium	0.5%
Real future dividend growth	1%
Real future rent increase	0.25%
Expected future inflation	2.5%

The yield on different asset classes currently are-
Gross Dividend Yield = 3.75%
Rental yield on property=6%
Gross Redemption Yield on Government Bonds=5%
Real Yield on Index Linked Government Bonds=1.5%

Assess the relative attractiveness of each of the asset classes for an investor. **[8]**

Q 7) **a)** You are advisor to an institutional investor which has been approached by an unlisted manufacturing company to participate in private debt placement. Describe the factors that you need to take into account while making recommendations to the investor. (5)

b) List the additional factors you would take into account, if instead of debt placement; the same company had approached for an equity participation. (3)

[8]

Q 8) A life insurance company which predominantly sells traditional life insurance policies has decided to launch a single premium immediate annuity product. The product offers a level annuity to an annuitant until his death in return for payment of a single premium. It is proposed to invest the single premium in 20 year coupon bearing Government bonds, which is the longest dated bond in the country.

a) Discuss the suitability of the proposed investment strategy. (4)

b) An alternative product that is currently under discussion is an "income only annuity", where a level income is paid to the annuitant until his death and on the death of the annuitant, the single premium purchase price, is paid as a death benefit. The investment strategy planned is the same as that given above. Discuss the risks inherent in the proposed strategy and how the same can be mitigated. (4)

[8]

Q 9) **a)** Describe the three types of advice that an actuary can provide. (3)

b) You are an actuary working in a consultancy firm and providing advice to an insurance company on building its internal capital model. Discuss the professional considerations that you need to take into account when providing such advice. (5)

[8]

Q 10) A life insurance company formed 7 years ago writes both with and without profit business. Due to its expansion plans the level of free assets has been falling steadily. The Finance Officer of the company is concerned that if no action is taken, then the regulator will intervene.

Discuss the possible courses of action available to the life insurance company and considerations that may be relevant to the decision. **[12]**

Q 11) Two years back along with 2 of your friends you established an IT Services Company. You own 33% of the shares of the Company. As a director, you draw a salary from the business. The company is planning to list in 3 years time. Apart from the shares, you have an inherited apartment, which you have currently rented out. You are planning to get married next year.

a) List the factors that need to be considered in determining your personal investment strategy. (3)

b) Analyze your current financial position. (5)

c) Determine how this position might change over the next five years. (5)

[13]

Q 12) A developing country is planning to strengthen the adequacy of general insurance company's provisions. It is considering to direct insurers to hold an extra cushion of assets (assessed at Market value) equal to

a) 30% of average of gross claims paid (before reinsurance) over the last 3 years before ;

b) 20% of average of gross premiums received over the last 3 years;

c) Rs 50 crore

(i) Explain the likely aim of this regulation. (5)

(ii) Comment on the suitability of this solvency regime and the improvements that can be made. (13)

[18]

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