INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

23rd May 2008

Subject CA1 – Core Applications Concepts
Paper I

Time allowed: Three Hours (09.45 - 13.00 Hrs)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATE

1. ***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 three hours to complete the paper.***
2. ***You must not start writing your answers until instructed to do so by the supervisor.***
3. ***The answers are not expected to be any country or jurisdiction specific. However, if examples/illustrations are required for any answer, the country or jurisdiction from which they are drawn should be mentioned.***
4. ***Mark allocations are shown in brackets.***
5. ***Attempt all questions, beginning your answer to each question on a separate sheet.***
6. ***Fasten your answer sheets together in numerical order of questions. This, you may complete immediately after expiry of the examination time.***

Professional Conduct:

"It is brought to your notice that in accordance with provisions contained in the Professional Conduct Standards, If any candidate is found copying or involved in any other form of malpractice, during or in connection with the examination, Disciplinary action will be taken against the candidate which may include expulsion or suspension from the membership of ASI."

Candidates are advised that a reasonable standard of handwriting legibility is expected by the examiners and that candidates may be penalized if undue effort is required by the examiners to interpret scripts.

AT THE END OF THE EXAMINATION

Please return your answer sheets and this question paper to the supervisor separately.

Q1) For direct property as an asset class, list

(i) the general investment characteristics (3)

(ii) the risk characteristics. (1)

[4]

Q2) State the main purposes for which a general insurance company analyses:

(i) claims data (3)

(ii) expenses (3)

[6]

Q3)

(i) Outline any 3 theories which explains the shape of the yield curve. (3)

(ii) Explain why a corporate bond might have a higher yield than a government bond of the same duration. (4)

[7]

Q4) Describe the reasons why life insurance companies need capital. **[7]**

Q5)

(i) Explain the following terms in the context of individual assets:

a) Marketability

b) Liquidity (2)

(ii) Describe the liquidity and marketability features of the assets that the following would normally expect to hold:

a) A venture capital fund that takes large stakes in new promising and unquoted firms in the entertainment industry

b) A fund that guarantees to return the capital invested plus interest after 3 years. The interest rate is fixed at the outset.

c) A fund that aims to make profits by trading in bonds.

d) A motor insurance company (8)

[10]

Q6)

(i) State the relationship between the total return on equities and the risk-free rate of return, expected inflation and the equity risk premium. (1)

(ii) Explain the effect over time on the components of the relationship in part (i) from the point when a country enters into a recession. (5)

[6]

Q7)

(i) List the uses of investment indices. (4)

(ii) Describe the particular uses of government bond indices. (3)

(iii) You have been asked to produce an index of domestic equity prices. Outline what information you would need and what decisions would you need to make before you could construct the index. (5)

[12]

Q8) A life insurance company is proposing to launch a 10 year single premium unit linked product with the following features-

- Maturity benefit- Maximum(No of units*Unit Price on date of maturity, return of Single premium)
- Surrender Benefit- No of units*Unit Price on date of surrender
- Death benefit- Return of Single Premium

The premiums received are proposed to be invested as follows

- 60% in 10 year zero coupon corporate bonds and 40% in ordinary shares.

The current yield to maturity on 10 year zero coupon corporate bonds is 3%. Ignore expenses.

(i) State the general principles of investment. (1)

(ii) Assess the risks and appropriateness to the company of following the proposed investment strategy. (7)

(iii) Outline an alternative investment strategy (2)

[10]

Q9) An employer sponsors a benefit scheme which includes the following features:

- Employees who leave employment with less than 2 years service receive no benefit.
- Employees who leave after 2 years are entitled to a lump sum benefit equal to a multiple of average salary (average of salary received during the immediately preceding 5 years). The multiple is ½ a month's salary for each completed year of service subject to a maximum of 15 month's salary. The benefit is payable on exit of the employee from service.
- On death in service, a lump sum equivalent 2 times the average annual salary received during the immediately preceding 5 years before death is payable

The employer wants to amend these features of the scheme to make it more attractive to potential new recruits. His objective is to do this without significantly increasing the cost of the scheme to the employer.

(i) Discuss why the existing scheme design may not appear attractive to individuals who are being recruited. (3)

(ii) Describe 4 changes to the benefit structure that might achieve the employer's objective, and explain how each change would achieve this objective. (4)

(iii) Discuss the implications for existing scheme members if the employer amends the scheme in any way that makes it more attractive to potential new recruits without significantly increasing the cost of the scheme to the employer. (7)

[14]

Q10) The government of a certain country is proposing to pass legislation creating a National Fund for payment of minimum wages for 12 months to employees made redundant in modernization of private textile factories. When an employee is made redundant monthly benefit equivalent to his last drawn monthly salary will be paid from the Fund for 12 months. The Fund will be financed by levies on private textile companies at a rate to be fixed by the Government and revised every year, if needed. The Fund is expected to be in place and active for a period of 8 years after which it is proposed to be wound up. The Government will make an initial corpus contribution of Rs 100 million to the Fund.

(i) List the parties which will be affected by the imposition of levies, outlining how each is affected. (5)

(ii) Discuss the factors the Fund should consider at this point in setting its investment strategy and managing its liabilities. (5)

(iii) Discuss the risks to the solvency of the fund. (5)

(iv) Describe ways in which the risks in (iii) can be managed. (5)

(v) a) List the potential conflicts of interest that an actuary might face in advising the National Fund on the levies it should charge.

b) Comment on how these potential conflicts could be managed. (4)

[24]

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