INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

18th May 2009

Subject SA6 - Investment

Time allowed: Three hours (9.45* - 13.00 Hours)

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. ** 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.*

3. *You must not start writing your answers in the answer sheet until instructed to do so by the supervisor*

4. *The answers are expected to be India Specific application for the syllabus and corresponding core reading. However, substantially the core reading material is still taken from material supplied by Actuarial Education Company which are meant for UK Fellowship examination. The core reading also contains some material which is India Specific, mostly the IRDA regulation. In view of this, it should be noted that focal point of answers is expected to be India Specific application. However if application specific to any other country is quoted in the answer the same should answer the question with reference to Indian environment.*

5. *Attempt all questions, beginning your answer to each question on a separate sheet.*

6. *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) ABC Ltd is an Indian publicly listed financial conglomerate. The parent holding company has issued equity and debt securities and has a number of subsidiaries including a Bank and a joint venture life insurance company. The parent holding company has recently appointed a new independent director to its Board. The independent director has had a very successful career at the highest levels of the civil service but has limited experience of the finance industry.

You are an actuary who has been appointed as Chief Risk Officer of this company with the responsibility of ensuring that there is a robust risk control framework throughout the parent company and all its subsidiaries including the monitoring of asset and liability related risks.

The independent director has sought for a meeting with you so that he can gain a better understanding about the operations of the group companies and seek your views on related matters. To allow you to prepare for the meeting, he has sent you some questions in advance of the meeting.

A) What is the current status of the Indian economy? (5)

B) Provide an overview of the US, UK and Japanese capital markets with particular reference to the recent developments in these markets. (8)

C) The Bank subsidiary has an international banking subsidiary ABC USA Ltd in the United States of America. This international subsidiary had bought a significant amount of asset backed securities as a long term investment several years ago. The independent director has asked for:

1) A detailed description of asset-backed securities with particular reference to the risk characteristics of mortgage backed securities [MBS] and collateralised mortgage obligations [CMOs] (9)

2) The recent problems encountered with asset back securities in the USA and UK markets (6)

3) The risk control mechanisms, which the international subsidiary must put in place to mitigate the risks associated with the investment in the asset-backed securities (4)

D) The Bank subsidiary has the highest credit rating within the group. This subsidiary has issued US dollar [USD] denominated convertible debt securities. The independent director has asked:

1) What are US Dollar denominated convertible debt securities? (2)

2) Describe the instruments that the bank could have bought to hedge the exchange risk inherent in the issue of the USD denominated convertible debt securities? (4)

E) The joint venture life insurance company subsidiary has enjoyed phenomenal growth over recent years. This insurance company writes predominately unit linked business. Hence a significant proportion of its profits are derived from the fund management charge levied in the unit funds. The unit funds are predominately invested in equities. The CFO of that subsidiary would like to hedge the equity risk but the insurance company regulations do not permit an insurance company to invest in derivatives.

1) Explain how the holding company could hedge the indirect equity risk. Briefly discuss the characteristics of that investment and comment on the residual risk that would remain unhedged. (4)

2) Briefly discuss the factors that need to be considered for determining an appropriate investment strategy for the assets backing the life insurance company's shareholders' fund (4)

F) In the days prior to the meeting with the Independent Director, there has been consistent media speculation that the parent company will carry out a rights issue. The share price has been depressed. During your meeting with the Independent Director, he mentions that the Board has been actively considering a rights issue but has decided that it will not and a public statement will be issued in the following morning. You had been contemplating investment in the shares of the company. What are your options now? (2)

[48]

Q 2) The employers in India make a payment of 15 days salary for every completed year of service as gratuity. This is paid to all employees who complete a minimum of 5 years of service with the employer. The gratuity funds (which are in the nature of defined benefit plans) are allowed to be managed by life insurers.

ACCESS is a large life insurance company in India and manages a gratuity portfolio on behalf of several employers. The size of the gratuity portfolio is large but the payouts are currently small for two reasons. First, the average age of employees in Indian companies is 30 years. Second, the employee turnover rate is high and many employees do not complete the vesting period requirement of 5 years. In such cases, the employer is not liable to make gratuity payments. Also since the gratuity payout up to Rs 3.5 lakhs is tax free in the hands of the recipient, many employers place an Rs.3.5 lakhs cap on the gratuity payout.

Given below are the portfolio values at the end of each quarter of the gratuity portfolio managed by ACCESS Life Insurance. New cash flows including net new contributions and the investment income (dividends or coupon payments) are all assumed to occur at the end of each quarter and are given in the following table.

The opening fund value at the beginning of the year is Rs 100 crores. The average fund value over the year (based on the daily fund size) is Rs 175 crores. The fund manager at ACCESS is given a benchmark sect oral split wherein he is expected to invest 85% of the money into bonds and rest into equities. The NAVs of bond and equity funds of PROVIDER which tracks the indices would be used for comparison purpose. At the beginning of the year the bond fund NAV of PROVIDER is Rs 10.2 and the equity fund NAV of PROVIDER is Rs 11.

The new net money flows which occur at the end of each quarter are also given in the following table. These net cash flows arise due to the contributions received from the employers and due to the benefit payments being made. The values of bonds and equities at the end of each quarter shown in the following table are after allowing for the contribution/payouts received / paid at the end of that quarter.

	Fund Values and Net New Moneys received by ACCESS (All amounts are in Rupees crores)				NAVs of fund offerings of PROVIDER (in Rupees)	
End of	Contributions /payouts	Total Bonds	Total Equity	Total Fund Value	Bond Fund NAV	Equity Fund NAV
Quarter 1	55	145	17	162	10.80	12.50
Quarter 2	15	168	12	180	11.40	9.00
Quarter 3	40	180	30	210	10.90	7.30
Quarter 4	-10	178	27	205	11.30	6.20

All contributions/payouts were made to/from the bond portfolio except the contribution received in the third quarter which was split equally and thus Rs 20 crores of the total of 40 crores were invested in bonds and rest Rs 20 crores into equities.

PROVIDER [referred to above] is another Life Insurance company which manages gratuity funds on a unit linked platform. This company has two index tracker funds, one which tracks NSE equity index (NIFTY) and another is a bond fund which tracks CRISIL bond index. The shares held in equity tracker fund are valued at market price and the bonds in the bond tracker fund are valued at the last traded price in the market. If there has been no trading in the last 15 days then the bonds are valued using the CRISIL Bond Valuer as the discounted present value of the cash flows (coupon and redemption amount). Both the funds have 1% fund management charge per annum. The investment income is reinvested and the NAVs reflect the same.

A) Calculate the money weighted rate of return [MWRR] and the time weighted rate of return [TWRR] for the equity fund, bond fund and the total fund of ACCESS. Assume that the investment income is reinvested and remains in the fund. Ignore the effect of taxes and expenses. State other assumptions, if any (9)

B) Compare the TWRR calculations of the bond fund and equity fund of ACCESS with the corresponding index funds of PROVIDER. Comment whether the fund manager at ACCESS has generated better returns on the bond and equity funds as compared to PROVIDER after allowing for the fact that PROVIDER NAVs have an inbuilt charge of 1% towards fund management charges [FMC]. The TWRR calculations pertaining to the bond and equity funds of ACCESS do not include an allowance for the fund management charge / expenses. (4)

C) The investment actuary wants to understand in detail the reasons for over or under performance. He uses the NAVs of PROVIDER to compute the notional-notional fund value as well as actual-notional (actual sector split and notional stocks) fund value. He allows for Rs.1.75 crores as fund management charge while doing these calculations. His calculations are summarized in the following table:

[Rs.in crores]

	Actual-Actual	Notional-Notional	Actual-Notional	Stock Selection out-performance	Sector Selection out-performance	Total
Fund Value	203.25	200.16	202.76	0.49	2.6	3.09

Verify the entries in the above table. Show all supporting calculations. (7)

D) Currently the bonds in the portfolio are valued at amortized book values while equities are recorded at market values. The regulator in India has mooted a proposal to value both bonds and equities at market price. The insurers in the country feel that it is very onerous to value all securities at market price. Briefly evaluate the advantages and disadvantages of valuing the bonds at market prices in the context of a gratuity portfolio. (3)

E) Discuss the factors that need to be considered for determining an appropriate strategic asset allocation policy for the gratuity portfolio (7)

F) To enhance the returns of the gratuity portfolio, the marketing director at ACCESS has suggested that the asset mix underlying the gratuity portfolio must be weighted in favour of corporate bonds. (6)

Briefly explain how you will assess the credit quality of corporate bonds? What are the considerations apart from credit quality, which will influence the investment decision?

G) The investment manager of ACCESS intends to invest in the debentures issued by a company in the Power sector. This company is a part of a large corporate conglomerate. The debenture issue of this company has got a credit rating of AA+ which a notch lower than what it would have been in a normal economic environment. The value of net assets of the company is Rs.5,000 crores and the operating profit last year was Rs.900 crores. The debentures are for a term of 7 years and carry a coupon rate of interest of 9% pa. The size of the issue is Rs. 1500 crores. The debentures will be issued at par.

Calculate the income cover and asset cover after the issue of the debentures and make an investment recommendation. State assumptions, if any. Ignore issue expenses (4)

[40]

Q 3) A general insurance company writes motor and employers' liability business. Its annual premium income is equally split between the two lines of business.
The investment portfolio of this company has 75% of the funds invested in Gilts and the remaining 25% in money market instruments.

A) Discuss the features of the liabilities of this company which must be taken into account for the purpose of formulating a strategic asset allocation strategy. (8)

B) The CFO of the company wants to enhance the investment returns by switching 10% of the funds into equity investments. Briefly discuss the suitability of this proposal (4)

[12]

****