INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

14th July 2022

Subject SA7 – Investment and Finance

Time allowed: 3 Hours 30 Minutes (14.30 - 18.00 Hours)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. ***Please read the instructions to examinees sent along with hall ticket carefully and follow without exception.***

2. ***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 is 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 candidate should answer the question with reference to Indian environment.***

3. ***Mark allocations are shown in brackets.***

Q. 1) You are an Investment Actuary working for a boutique investment management firm specializing in pension de-risking in a developed country with a deep financial market. The pension regulations in the country require a Defined Benefit (DB) style pension with minimum guaranteed death benefits to the current employees and pensioners (and their dependents).

As per the regulations, the pension scheme offered by the corporate (employers) is required to be fully funded and to keep pension assets separate from those on the corporate balance sheet; the scheme runs through an independent trust managed by the trustees. Actuarial valuations of the pension scheme are regularly carried out and any deficit (Assets – Liabilities) is funded by the employer on regular basis. Please note that a deficit once funded is supposed to keep the scheme operational from returns it generates from its investments with no future contributions required if the experience is favourable. The funds are invested in major asset classes as per the strategic and tactical investment strategy approved by the trustees.

For all big corporates, those have been in operation for several decades; the pension liability is becoming too large and is a significant proportion compared to their balance sheets. The accumulated pension liabilities across all pension schemes in the country are quite large and investments made by pension funds now constitute a major proportion across all major class in the country.

The economy has been reeling under a low-interest rate environment for several years now; the rates were kept artificially low to stimulate the economy out of the 2008 credit crisis. Further, there is a marked improvement in longevity in the general population, primarily due to high living standards, high-quality health services made available to every citizen and technological advancement in the health sector. The trend is expected to continue in future as well.

The impact of low-interest rates and longevity improvement had a significant impact on actuarial valuations and there has been a trend of increased liability (and higher deficits) every year. Funding of this surplus has been a challenge to companies as this is eating their profits from the core operations. Equally, trustees have been facing challenges in making employers fund the gap as they are asking lots of challenging questions on increased liabilities and arguing that trustees not making the right investment decision to keep the scheme afloat without future contributions from employers.

Lately, there is a trend of closing down the scheme to new entrants and offering them a defined contribution scheme, where contributions are made on current service and entire investment and other risks (like longevity) are borne by the employee. The current trend is putting pressure on both employers and trustees and both parties are working on opting for a solution that de-risk the scheme from company's perspective and still fulfill their obligations to the scheme members.

You regularly meet pension fund trustees of the large corporates who want to understand the developments in the market to enhance the returns on their investment portfolio or to help employers de-risk the portfolio or both, to help them make strategic and investment decisions.

i) Prepare a short note on de-risking of pension plan that can be shared with the trustees covering brief description of, needs of key stakeholders and considerations for implementing the solution. (10)

Over the last several years, corporate bond market has developed a lot and presently it constitutes a significant portion of investment portfolio managed by pension funds.

ii)

a) Explain the reason why the corporate bond market has developed and why it is a choice in investment portfolio of pension funds. Please take into account the key global financial events since 1970 affecting the bond market while formulating the answer. (5)

b) Briefly explain the difference between the following classifications of corporate bonds: (8)

- fixed interest and index linked;
- Investment grade and non-investment grade;
- Actual and synthetic; and
- High yield debt and Emerging market debt

You have been asked to develop a tool to explore the arbitrage opportunity in the corporate bond market. Though the arbitrage opportunity is non-existent given the depth of the market, you decided to build a tool to perform valuation of bonds basis fundamental factors that drive the prices and thus assess if a given security is appropriately priced.

iii) Explain the key factors/considerations you will have to build such a tool. (5)

Benchmarking of portfolio returns has always been a key decision while entering in investment service agreement with the trustees.

iv)

a) Explain why identifying benchmarking is a critical decision and explain key considerations to identify the correct benchmarking strategy. (3)

b) Discuss on merits/de-merits of using notional portfolio vs index in using benchmarking portfolio. (3)

c) Discuss key considerations in comparing and selecting suitable index from universe of indices available in the market. (4)

One of the pension funds you are advising has considered using index as benchmark for portfolio investment and management. The investment manager can either try replicating the index or select sub portfolio of assets (commonly referred to as stratified sampling).

v)

a) Discuss the pros and cons of using index based investment strategy and what are the key success factors. (4)

b) Prepare a note on index based investment strategy covering both index replication and stratified sampling, identifying pros and cons and key considerations/challenges in implementing index replication and stratified sampling strategy. (8)

[50]

Q. 2) IRDAI issued a circular permitting investment in derivatives in 2017 for certain portfolio to manage investment rate risk. Please answer the following questions based on the circular.

i) Why use of derivative is not permitted for Unit Linked Insurance Product (ULIP) business? (2)

ii) List the derivative instruments permitted to manage investment rate risk. (2)

iii) Interest rate with implicit and explicit options are not permitted, explain the rationale behind such direction. (2)

iv) List the permitted purpose for which interest rate derivatives can be used. (4)

v) Explain the Current exposure method as explained in the guidelines. (5)

vi) List the features for managing derivative investment covering the following: (5)

a. Internal Risk Management Policy & Processes
b. Exposure & Prudential Limits

[20]

Q. 3) You are working as an Investment Actuary for an investment bank in a developed country with assets under management of over USD 250 Billions. In the past, the fund has taken significant exposure to mortality risk by purchasing blocks of life insurance businesses. However, the bank is under constant pressure to improve its financial performance. For various reasons, the bank's credit rating has also declined to BB- from AAA- two years ago.

BASEL regulations do not have a specific capital charge for insurance risk and banks were keeping the low capital charge for insurance risk as compared to other risks. Regulators have identified this regulatory arbitrage and proposed to have an explicit capital charge which is supposed to be significant compared to debt/equity. This additional capital requirement may put significant strains on the financial position of the bank.

The Chief Investment Officer (CIO) of the bank has asked you to explore ways in which insurance risk beyond a tolerance level can be offloaded to the capital market. You decided to put a proposal to issue mortality bonds to offload these assets.

i) Prepare a draft note on mortality bonds covering the comparison of these bonds with corporate bonds, types of mortality bonds, investor's needs, operational structure, and key considerations from both bank's and investor's perspectives. (12)

An initial assessment of the market indicates that there is a limited appetite for mortality bonds. However, given the low rating of the bank, there seems to be less interest in investing in these bonds. The CIO suggested modifying the bonds and issuing bonds to the wider capital market and suggests you to explore securitizing insurance portfolios and issuing bonds in the market.

ii) Prepare a note on how the bank can create a securitized portfolio and issue bonds to wider stakeholders explaining how a low-rated institution can still issue high-grade security using securitization. (8)

Recently, a regulation has been issued by regulators that prohibits investment banks or their subsidiaries to take direct exposure to the insurance risk. They can, however, become a party to the transaction between two insurers/reinsurers/pension funds who want to eliminate/diversify their exposure in different insurance segments/geographies.

The CIO has made an observation that bank can increase their profits by facilitating mortality and longevity swaps to above institutional investors by participating in such deals.

iii) Prepare a note on the structuring of these swaps identifying the needs of counterparties, and how the margin will be earned by the bank. (3)

iv) Please explain the risk to the bank if counterparty risk is not managed properly and provide details of how the bank will manage the counterparty risk by listing down some key points. (3)

In order to improve the performance of the fund, the CIO has asked the Equity fund manager to look for upcoming listed tech companies for investment. The CIO believes that the existing tech companies have reached the peak of growth and need to look for newer tech companies:

v) What are the risks associated with the investment in a tech company and what are the risk managing strategies? (4)

[30]

****