

INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

12th November 2008

Subject ST5 — Finance and Investment A

Time allowed: Three hours (9.45* – 13.00 Hrs)

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 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.
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) a) List the factors that households should consider when investing? (4)
- b) Explain why households look for diversification of their investments? (2)
- [6]
- Q 2) You are working for one of the brokerage firms in India. You are one of the research analysts working for the firm. The firm's philosophy is to advise clients on purchase or sale of stocks based on fundamental analysis of the stocks. You are the analyst for stocks in the Oil Sector having oil refining & marketing companies owned by both the government and the public.
- i) List the sources of information you would take into consideration while analyzing the stocks in this sector. (5)
- ii) Describe the steps you follow in order to establish whether a stock should or should not be part of your client's portfolio. (10)
- iii) The price of one of the oil company's stocks is falling continuously compared to the prices of other companies. You have been asked to analyze the reasons for this. Explain the possible reasons for such a fall in the stock price of this company. (5)
- [20]
- Q 3) A developing country is planning to introduce a legislation to control the investment markets. The government has asked you to assess the economic costs of regulating these markets. Explain briefly the points you would make in your report. [5]
- Q 4) (a) Two options have identical characteristics except that one is an American option and the other is an European option. Explain which option will have the greater market price. (2)
- (b) In recent times the equity markets has become very volatile. You are a Fund Manager of a large Mutual Fund managing a portfolio consisting of 80% Equities and 20% bonds. You expect the equity market to remain volatile in the near term.
- i) Suppose you believe that there will be a significant decline in the stock prices. Using an appropriate pay off diagram describe an option strategy you would use to limit the downside risk of the equity portfolio. (2)
- ii) Suppose you believe that there is going to be a large movement in stock prices, but you are uncertain of the direction. With the help of an appropriate pay off diagram describe an option strategy that can help you to profit from this belief. (4)
- iii) You want to increase the exposure to debt (bonds) relative to equities by entering into a swap contract rather than carrying out a series of transactions in the physical (cash) markets. Discuss the merits and demerits of using swaps vis-à-vis cash market transactions in this context. (5)
- [13]

- Q 5) Describe briefly the features that characterize each of the following economic groups:
 -General Industries
 -Utilities
 -Financial Companies [9]
- Q 6) a.) A fund consists of Rs. 1,000,000 investment in asset A and Rs. 1,000,000 investment in asset B. Assume that the daily volatilities of both assets are 1% and that the coefficient of correlation between their returns is 0.3. Calculate the 5 day 95% value at risk for the portfolio. (3)
- b.) A fund manager manages two large equity portfolios which aim to outperform a specified index. Briefly discuss how VaR can be used to estimate the relative riskiness of the two equity portfolios. (4)
- c.) Typically a linear model based on the normality assumption is used for estimating the VaR of an investment portfolio. Explain why such a linear model may not provide an accurate estimate of VaR for an investment portfolio containing options. (2)
- d.) “Many fund managers use financial stress testing and back testing in addition to VaR for assessing, the risk of their investment portfolios”. Comment on this statement (4)
- [13]
- Q 7) The trustees of a pension fund are reviewing the performance of the fund manager of the equity portfolio of the pension fund. The trustees have stipulated that the safety of the funds is as important as the return on funds. The equity portfolio is invested to a large extent in the top 100 listed stocks and a small proportion in the next 100 stocks in terms of market capitalization. The equity portfolio of the pension fund has provided an average return of 24% pa over the last 3 years with a standard deviation of 27%pa.
- The performance of this equity portfolio needs to be evaluated using BSE 250 - an equity index comprising top 250 stocks in terms of market capitalization- as the benchmark. This index has provided an average return of 18% pa with a standard deviation of 21% pa over the same period.
- The beta of the equity portfolio is calculated 1.5.
- The risk free rate of interest is 6.5% pa.
- i) Calculate the Treynor and Sharpe ratios for the equity portfolio and comment on the results. (6)
- ii) Comment on the performance of the fund vis-a-vis the index. (2)
- iii) The trustees want to understand the appropriateness of the Fund Manager’s strategy from an Asset Liability Management perspective. Set out the points you would make in your report (5)
- [13]

- Q 8) i) Describe a classical split rate system of corporation tax (2)
- ii) The government is reviewing the tax structure to encourage long term investment in listed equity stocks.
Describe methods of taxation that would encourage such longer term investment (4)
[6]
- Q 9) a) A financial institution has entered into a 10 year currency swap with ABC Inc, a manufacturing company.
Under the terms of the swap, it (the financial institution) receives interest at 3% pa in Swiss Francs and pays interest at 8% pa in US Dollars (USD). Interest payments are exchanged once a year. The principal amounts are 7 million dollars and 10 million francs.

ABC Inc has declared bankruptcy at the end of year 6 when exchange rate is USD 0.80 per Swiss Franc
- i. Calculate the forward exchange rates at the end of year 6. (2)
- ii. Calculate the cost of default to the financial institution. Assume that at the end of year 6, the interest rate is 3% pa in Swiss Francs and 8% pa in USD for all maturities. (5)
All interest rates are quoted with annual compounding
- b) “The expected loss from a default on a swap is less than the expected loss from the default on the loan with the same principal”.
State giving reasons whether or not you agree with this statement? (2)
- c) As on a given date the LIBOR Zero curve is flat at 5% pa [continuously compounded] out to 1.5 years. The swap rates for 2 year and 3 year semi-annual pay swaps are 5.4% and 5.6% respectively. Estimate the LIBOR zero rates for maturities of 2 years and 2.5 years. Assume that the 2.5 year swap rate is the average of the 2 year and the 3 year swap rates. (4)
- d) List the credit events which are likely to impact a credit default swap (2)
[15]
