INSTITUTE OF ACTUARIES OF INDIA

EXAMINATIONS

23rd March 2017

Subject ST5 – Finance and Investment A

Time allowed: Three Hours (14.45* – 18.00 Hours)

Total Marks: 100

INSTRUCTIONS TO THE CANDIDATES

1. *Please read the instructions inside the cover 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 you are required to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You have then three hours to complete the paper.*
3. *You must not start writing your answers in the answer sheet unless 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.*
7. *Please check if you have received complete Question paper and no page is missing. If so, kindly get a new set of Question paper from the Invigilator.*

AT THE END OF THE EXAMINATION

Please return your answer booklet and this question paper to the supervisor separately. You are not allowed to carry the question paper in any form with you.

Q. 1) Describe prospect theory with the help of a diagram. **[4]**

Q. 2) **i)** Explain the term “Chain-linking”. (3)

ii) Describe the relevance of indices to all stages of the Asset Management Process. (3)

iii) You work for an investment analytics Company. Your Company wants to construct an investment property index of residential apartments in a city, where majority of flats are rent out. Based on this index, your Company would like to measure performance of similar portfolios. Your boss has asked you to discuss the main types of investment portfolio index and suggest which index would be more suitable for this scenario. Draft a suitable reply. (10)

iv) Outline the problems in constructing property indices. (6)

[22]

Q. 3) **i)** Suppose that the risk-free interest rate is 8% per annum with continuous compounding and that the dividend yield on a stock index is 3% per annum. The index is standing at 100, and the futures price for a contract deliverable in six months is 105. What arbitrage opportunities does this create? (3)

ii) The spot price of gold is INR 2,500 per gram. The storage costs are INR 12 per year per gram payable monthly in advance. Assuming that interest rates are 8% per annum with continuous compounding for all maturities, calculate the futures price of gold for delivery in four months. (3)

iii) The Government wishes to curb physical purchase of gold and wants individuals to take exposure to gold by investing in a gold index (e-gold). This index would be exchange traded, with the daily price reflecting the price of the underlying 99.99% purity gold. Discuss the pros and cons for both the Government and individuals of investing in e-gold instead of holding physical gold. (5)

iv) To incentivise individuals to invest in e-gold index, Government is considering offering a discount per gram of gold purchased in electronic form. For a typical investment horizon of 3 years, storage costs at INR 12 per year per gram and interest rates are 8% per annum with continuous compounding for all maturities, how much discount would be required for a breakeven? (2)

[13]

Q. 4) **i)** Outline the main forms of Government policy. (5)

ii) Additionally, discuss the other relevant areas where Government policy can influence commercial and economic landscape. (4)

[9]

Q. 5) **i)** Outline the main reasons for measuring portfolio performance. (5)

ii) List the reasons why the performances of two portfolios differ? (4)

[9]

Q. 6) Consider the following performance data for two portfolio Managers A and B and a common benchmark portfolio:

	BENCHMARK		MANAGER A		MANAGER B	
Asset class	Weight	Return	Weight	Return	Weight	Return
Stock	0.70	10.00%	0.60	12.00%	0.40	7.00%
Bonds	0.20	8.50%	0.30	9.00%	0.40	11.50%
Cash	0.10	3.40%	0.10	2.00%	0.20	4.30%

i) Calculate:
a) The overall return to the benchmark portfolio
b) The overall return to Manager A's actual portfolio; and
c) The overall return to Manager B's actual portfolio. (3)

ii) Outline the key differences between strategic asset allocation and tactical asset allocation? What is the advantage of having additional TAA limits? (4)

iii) Using attribution analysis, calculate
a) The asset allocation selection profit for Manager A, and
b) The sector selection profit for Manager B. (2)

iv) Using these numbers in conjunction with your results from Part i), comment on whether these managers have added value through their TAA position or their stock selection within as asset class, or both. (2)

[11]

Q. 7) **i)** An investment bank has entered into a swap with Company Z for a term of 3 years. Under the terms of the swap, the Company Z would pay the fixed rate and receive floating rate. The fixed interest rate is 6% and the floating interest rate is 12-month MIBOR.

Both the parties have agreed to compound forward the interest until the swap reaches its maturity date, instead of paying the interest yearly. That is, the accrued interest will be paid out at the end of the swap term. The fixed side compounds at 5.8% and the floating side compounds at 12-month MIBOR minus 10 basis points. The MIBOR zero curve is flat at 7% with annual compounding and the notional principal is INR 200 million. Calculate the value of the swap to the Company Z. (8)

ii) Explain the term "Cross Hedging". (2)

iii) An airline expects to purchase one million gallons of jet fuel in one month and decides to use heating oil futures for hedging. The table below gives, for 6 successive months, data on the change, ΔS, in the jet fuel price per gallon and the corresponding change, ΔF, in the futures price for the contract on heating oil that would be used for hedging price changes during the month.

Month	Change in futures price per gallon (ΔF)	Change in fuel price per gallon (ΔS)
1	0.032	0.043
2	0.005	0.002
3	-0.002	-0.001
4	0.001	0.008
5	0.019	0.028
6	-0.029	-0.009

It is also given that each heating contract traded on the exchange is on 20,000 gallons of heating oil. Determine the strategy the airline should follow? (7)

[17]

Q. 8) You have recently read articles that talk about likely increase in mergers and acquisitions (M&A) activity in the insurance industry.

i) Discuss potential reasons for firms to opt for mergers or acquisitions. (3)

ii) If you were to build a basic discounted cashflow model to value the share price of an insurance company, how would you go about it? (10)

iii) In one likely M&A transaction, the mismatch in company valuation between the seller and buyer is very high. Given your understanding of the critical assumptions above, which is the most price sensitive assumption and why? (2)

[15]

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