

Question Paper
Portfolio Management (CFA640) : July 2008

Section A : Basic Concepts (30 Marks)

- This section consists of questions with serial number 1 - 30
- Answer all questions.
- Each question carries one mark.
- Maximum time for answering Section A is 30 Minutes.

1. Which of the following assumptions is common between CAPM and Markowitz Model?

[<Answer](#)
≥

- (a) All investments are perfectly divisible
- (b) Borrowing and lending at the risk-free rate are unrestricted
- (c) All investors have uniform, single period investment horizon
- (d) Capital markets are in equilibrium
- (e) Investors are risk-averse, and are expected utility maximizers.

2. Mr. Arnav has allocated Rs.2,00,000 for investment. He wants to construct a fully diversified portfolio with the systematic risk (beta) of 1.6. Which of the following strategies can fulfill his desired objective?

[<Answer](#)
≥

- (a) Invest 60% of funds in the market portfolio and borrow 160% of funds at risk free rate
- (b) Invest 160% of funds in a stock with beta of 1.6 and borrow 60% of funds at risk free rate
- (c) Invest 100% of funds in the market portfolio and borrow 60% of funds at risk free rate
- (d) Invest 100% of funds in a stock with beta of 1.6 and borrow 60% of funds at risk free rate
- (e) Invest 160% of funds in the market portfolio and borrow 60% of funds at risk free rate.

3. For a stock, the residual variance of returns is $48(\%)^2$ and its beta is 1.35. If the variance of the market's returns is $72(\%)^2$, the coefficient of determination of stock's return is approximately

[<Answer](#)
≥

- (a) 0.53
- (b) 0.65
- (c) 0.73
- (d) 0.82
- (e) 0.94.

4. As per Bielard, Biehl and Kaiser Five-Way model, which of the following type of investors are swayed too much by the trend and do not have any expertise or opinion about investments?

[<Answer](#)
≥

- (a) Individualists
- (b) Adventurers
- (c) Celebrities
- (d) Guardians
- (e) Straight Arrows.

5. In reality, the Security Market Line is a band instead of a thin line because of

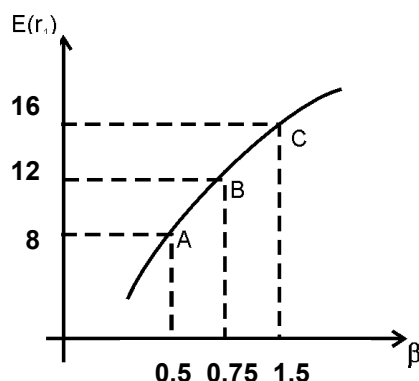
[<Answer](#)
≥

- I. The effect of taxes.
- II. The information asymmetry.
- III. The existence of transaction costs.

- (a) Only (I) above
- (b) Only (III) above
- (c) Both (I) and (II) above
- (d) Both (II) and (III) above
- (e) All (I), (II) and (III) above.

6. Systematic asset allocation depends on certain assumptions. In this regard, which of the following statements is/are **not true** regarding the assumptions of such an asset allocation process? [<Answer](#)
 I. The markets do not provide explicit information about the available returns.
 II. The relative expected returns reflect consensus.
 III. Expected returns do not provide clues to actual returns.
 (a) Only (I) above
 (b) Only (III) above
 (c) Both (I) and (II) above
 (d) Both (I) and (III) above
 (e) All (I), (II) and (III) above.
7. The standard deviation of returns of a portfolio of two stocks will be the weighted average of the standard deviation of returns of the stocks, if the coefficient of correlation between the returns of two stocks is [<Answer](#)
 (a) zero
 (b) -1
 (c) +1
 (d) 0.5
 (e) -0.5.
8. If the required return of a security is greater than its expected return, the security is [<Answer](#)
 (a) Underpriced
 (b) Overpriced
 (c) Fairly priced
 (d) Highly risky
 (e) Less risky.
9. A bond swap in which an investor seeks to increase the portfolio's yield to maturity by swapping out of a lower yield bond into a higher yield bond is termed as [<Answer](#)
 (a) Substitution Swap
 (b) Risk Neutral Swap
 (c) Rate Anticipation Swap
 (d) Risk Altering Swap
 (e) Pure Yield Pickup Swap.
- 10 On July 01, 2007, Mr.Dipesh bought 100 shares of Excel Ltd. at Rs.600 per share for a period of one year. He received a total dividend of Rs.400 during the year. If the price of the share, on July 01, 2008, is Rs.833, the holding period yield to Mr.Dipesh is [<Answer](#)
 (a) 12.00%
 (b) 19.05%
 (c) 25.75%
 (d) 39.50%
 (e) 53.15%.
- 11 Which of the following is/are **not** the characteristic(s) of an arbitrage portfolio? [<Answer](#)
 I. A net positive initial investment cost.
 II. A perfectly hedged portfolio position.
 III. The certainty of a positive value at termination of the position.
 (a) Only (I) above
 (b) Only (II) above
 (c) Only (III) above
 (d) Both (I) and (II) above
 (e) Both (II) and (III) above.
- 12 An investment strategy designed to earn a minimum rate of return while allowing the investor to benefit substantially from the positive returns generated by an investment in a risky portfolio is called [<Answer](#)
 (a) Portfolio dedication
 (b) Portfolio insurance
 (c) Portfolio revision
 (d) Portfolio attribution
 (e) Portfolio balancing.

- 13 Assume that one factor APT model depicts the expected return – beta relationship as shown in the figure given below for three stocks A, B and C. [<Answer](#)



Assuming that the prices of all the stocks are same, which of the following combination of stocks results into a zero beta portfolio with maximum return?

- (a) Buy 6 stocks of C and sell 18 stocks of A
 - (b) Buy 40 stocks of B and sell 20 stocks of C
 - (c) Buy 30 stocks of A and sell 10 stocks of C
 - (d) Buy 20 stocks of C and sell 40 stocks of B
 - (e) Buy 12 stocks of A and sell 8 stocks of B.
- 14 Expected return on a portfolio is 18% and standard deviation of its returns is 13%. If risk tolerance of an investor is 55%, the risk penalty of the portfolio is [<Answer](#)
- (a) 3.07%
 - (b) 3.25%
 - (c) 3.66%
 - (d) 3.85%
 - (e) 4.01%.
- 15 Mr.Sumit has gone short on T-bond futures. In order to make delivery rather than liquidating his position by buying back the contract prior to the settlement date, he has identified the following five bonds to choose one among them: [<Answer](#)

Bond	Coupon (%)	Quoted Price (\$)	Conversion factor
A	7.25	115.1875	1.144
B	7.625	119.7813	1.1875
C	7.125	114.75	1.141
D	7.50	117.469	1.166
E	7.150	115.025	1.143

Assuming that the current futures settlement price is \$100.50, the cheapest-to-deliver bond (CTD) to be selected by Mr.Sumit for delivery is

- (a) A
 - (b) B
 - (c) C
 - (d) D
 - (e) E.
- 16 Which of the following statements is **false** with respect to leading indicator approach? [<Answer](#)
- (a) This approach is valuable in indicating the direction of changes in economic activity
 - (b) This approach is based on movement of selected economic factors, which indicate the movement of economy
 - (c) This method does not convey any information on the magnitude and duration of change
 - (d) This approach uses flow of funds or liquidity data to forecast the changes in general economic scenario
 - (e) Residential construction, corporate profits and change in general price level can be considered as leading indicators.

- 17 The portfolio of Mr. Anand had a beginning value of Rs.50 lakhs and after a year an ending value of Rs.67.50 lakhs. If Mr. Anand receives Rs.6.25 lakhs at the end of 6 months as dividends, the Money Weighted Rate of Return (MWROR) of Mr. Anand's portfolio is [<Answer](#)
>
- (a) 17.24%
 - (b) 18.24%
 - (c) 18.76%
 - (d) 20.24%
 - (e) 21.23%.
- 18 In hedge fund strategies, which of the following risks arises due to taking large positions in some specific types of assets? [<Answer](#)
>
- (a) Market risk
 - (b) Operational risk
 - (c) Greeks risk
 - (d) Non-market, common factor risk
 - (e) Herd risk.
- 19 The current price of Sahara Petroleum's stock is Rs.225 and it is expected that price of the stock may either go up to Rs.250 or go down to Rs.190. If strike price of call option of Sahara Petroleum's stock is Rs.200 and risk-free rate is 7.5% , the probability of increase in stock price is [<Answer](#)
>
- (a) 0.30
 - (b) 0.56
 - (c) 0.64
 - (d) 0.87
 - (e) 0.95.
- 20 Bond laddering involves buying bonds of different [<Answer](#)
>
- (a) Prices
 - (b) Durations
 - (c) Convexities
 - (d) Coupons
 - (e) Maturities.
- 21 The maximum possible loss to an investor who has bought a call option is [<Answer](#)
>
- (a) Infinite
 - (b) Current price of the underlying asset
 - (c) Strike price
 - (d) Option premium
 - (e) Purchasing price of the underlying asset.
- 22 Which of the following statements is **true** regarding Dollar Cost Averaging (DCA)? [<Answer](#)
>
- (a) It works best when there is a continuous decrease in the price of the stock
 - (b) The benefits of DCA will be high in the latter periods of investment cycle
 - (c) The DCA helps in figuring out the stocks to be invested
 - (d) This technique generally gives best results when undertaken over a short period of time
 - (e) This technique is suitable for those who are building a fund and have periodical inflows.
- 23 A well-managed investment portfolio of any institutional investor must have a portion of its overall investment dedicated to the real estate investment. The possible reason(s) for this could be [<Answer](#)
>
- I. To hedge against unexpected inflation or deflation.
 - II. To reduce the overall risk of the portfolio by combining asset classes that respond differently to expected and unexpected events.
 - III. To deliver strong cash flows to the portfolio.
 - IV. To constitute a part of a portfolio that is a reasonable reflection of the overall investment universe.
- (a) Only (II) above
 - (b) Both (I) and (IV) above
 - (c) Both (II) and (III) above
 - (d) (I), (II) and (III) above
 - (e) All (I), (II), (III) and (IV) above.

- 24 Mr. Sandeep, a portfolio manager managing a corpus of Rs.1 million provided a return of 14.68% during a period of one year. During the same period, the market index recorded a return of 12.45% with standard deviation of 15.42%. The standard deviation of portfolio returns was 21.62%. Therefore, the return from net selectivity for the above portfolio assuming T-bills are yielding a return of 7.5% is [<Answer](#)
 (a) – 0.36%
 (b) – 0.19%
 (c) + 0.24%
 (d) + 0.36%
 (e) + 0.42%.
- 25 The uncertainty of the ability of an investor to exit from an investment when he desires is referred to as [<Answer](#)
 (a) Business risk
 (b) Financial risk
 (c) Liquidity risk
 (d) Market risk
 (e) Inflation risk.
- 26 Mr. Sanyam, a speculator bought a straddle at a strike price of Rs.95 on the stock of VSF India Ltd. when it was trading at Rs.90. He paid a total premium of Rs.8. The break-even prices for the speculator are [<Answer](#)
 (a) Rs.91 and Rs.99
 (b) Rs.89 and Rs.111
 (c) Rs.89 and Rs.103
 (d) Rs.87 and Rs.103
 (e) Rs.81 and Rs.98.
- 27 Index futures expiring in the month of August is presently trading at 5175. The multiple of each contract is 50. If the initial margin calculated by VaR at 99% confidence level is Rs.23,598, the daily volatility in futures price is [<Answer](#)
 (a) 1.95%
 (b) 2.14%
 (c) 2.56%
 (d) 3.04%
 (e) 4.12%.
- 28 Which of the following statements is/are **true** with respect to conflict(s) arising between Sharpe's and Treynor's measures of portfolio performance in ranking the portfolios? [<Answer](#)
 I. Sharpe's ratio considers systematic risk in measuring portfolio performance.
 II. Sharpe's ratio should be used, when we expect substantial presence of unsystematic risk in the portfolio.
 III. Treynor's ratio should be used, when the portfolio is fully diversified.
 (a) Only (I) above
 (b) Both (I) and (II) above
 (c) Both (I) and (III) above
 (d) Both (II) and (III) above
 (e) All (I), (II) and (III) above.
- 29 Which of the following is/are the main characteristic(s) of the information ratio? [<Answer](#)
 I. Value added depends on the managers' prospects and aggressiveness.
 II. The information ratio estimates ex-post value added and relates this to ex-ante opportunity available in the future.
 III. The residual frontier that describes the opportunities accessible to the active manager cannot be identified by the information ratio.
 (a) Only (I) above
 (b) Only (III) above
 (c) Both (I) and (II) above
 (d) Both (II) and (III) above
 (e) All (I), (II) and (III) above.

30 Consider the following information in relation to three stocks Amber Ltd., Base Ltd. and Camway Ltd.:

[<Answer](#)
[≥](#)

Stock	Realized Return (%)	Beta
Amber Ltd.	18	1.25
Base Ltd.	15	1.10
Camway Ltd.	17	1.20

A portfolio is created consisting of above three stocks in equal proportions. If the market index generates a return of 12.5% and the risk free rate is 7.5%, the residual return generated by the portfolio is

- (a) 1.74%
- (b) 2.40%
- (c) 2.85%
- (d) 3.25%
- (e) 4.10%.

END OF SECTION A

Section B : Problems/Caselet (50 Marks)

- This section consists of questions with serial number 1 – 5.
- Answer all questions.
- Marks are indicated against each question.
- Detailed workings/explanations should form part of your answer.
- Do not spend more than 110 - 120 minutes on Section B.

1 The following is the information pertaining to two stocks - Altastar and Betastar:

[<Answer](#)
[≥](#)

Stock Altastar

Expected Return (%)	Probability
10	0.10
12	0.50
18	0.30
20	0.10

Stock Betastar

Expected Return (%)	Probability
8	0.20
13	0.30
15	0.40
20	0.10

The coefficient of correlation between the returns on stocks Altastar and Betastar is 0.05. A portfolio is constructed by allocating the funds between Altastar and Betastar in the ratio of 3:2.

You are **required** to:

- a. Compute the expected return and the standard deviation of returns of stocks Altastar and Betastar. **marks (6)**
- b. Calculate the expected return on the portfolio. **marks (2)**
- c. Calculate the portfolio risk. **marks (2)**

2 Suppose that seven portfolios experienced the following results during a ten year period:

[<Answer](#)
[≥](#)

Portfolio	Average annual return (%)	Standard deviation (%)	Correlation with the market
A	17.6	28.0	0.81
B	13.0	18.0	0.55
C	8.9	14.8	0.38
D	21.0	25.7	0.75
E	(-)4.0	3.0	0.45

F	22.6	18.7	0.63
G	14.7	9.5	0.98
Market portfolio	12.5	14.0	
Risk free rate	7.5		

You are **required** to:

- Rank these portfolios using Sharpe's and Treynor's ratios. marks
(8)
- Compare the rankings obtained in (a) above and explain the reasons behind differences, if any. (1 mark)
- Identify the portfolios outperforming the market. marks
(2)

3 Recent spurt in commodity prices especially in case of gold has attracted the attention of many portfolio managers. Moreover, gold is also regarded as a safe haven in the current scenario when the equity market is tumbling and is becoming unpredictable and volatile. With a view to safeguarding the returns of his clients' portfolio, Mr. Vinamra, a portfolio manager is contemplating to diversify the portfolio by going long on gold futures.

[<Answer](#)
≥

On the other hand, Mr. Ayush is a contrarian portfolio manager who is of the view that this upcycle trend of gold price remains a major uncertain and as such price will fall soon. To benefit from his view and enhance the return of his clients' portfolio, he goes short on gold futures.

The size of each gold futures contract is 100 grams.

The initial margin required for each contract is Rs.30,000 and the maintenance margin is set at Rs.28,000.

Mr. Vinamra and Mr. Ayush took their positions in futures contract on April 15, 2008. The settlement price of a gold futures contract on that date on NCDEX was Rs.11,567.

The settlement prices on subsequent eight days were as follows:

Day	Settlement price (Rs. per 10 grams)
1	11,581.54
2	11,630.29
3	11,617.35
4	11,426.85
5	11,265.96
6	11,306.78
7	11,410.65
8	11,598.45

You are **required** to calculate the mark-to-market cash flows, the daily closing balances and net profit (or loss) in the account of:

- The portfolio manager, Mr. Vinamra who has gone long on 5 contracts of gold futures. marks
(6)
- The portfolio manager, Mr. Ayush who has gone short on 2 contracts of gold futures. marks
(6)

Caselet

Read the caselet carefully and answer the following questions:

4 According to the caselet, the setting up of Real Estate Investment Trusts (REITs) paves the way for wider participation by retail investors in the country's booming real estate sector and ensures that property markets are suitably expanded with proper regulation for benefits of investors in real estate. In this context, explain the advantages of REITs to the retail investors in specific and property markets and economy in general.

[<Answer](#)
≥

marks
(9)

5 As mentioned in the caselet, SEBI came out with a number of draft guidelines for setting up and operating of REITs. Interpret the rationale behind the various guidelines highlighted in the caselet.

[<Answer](#)
≥

marks
(8)

The Associated Chambers of Commerce and Industry of India (Assocham) has proposed creation of Real Estate Investment Trusts (REITs) on the lines of those prevalent in countries such as Singapore, the U.S. and Japan to ensure that property markets are suitably expanded with proper regulation for benefits of investors in real estate. Presently in India, the presence of high stamp duties and capital gains taxes led to high incidences of non registration of property transactions and no proper disclosures. The proposed real estate investment trusts have been existing in several economies with a developed property market since 1960's. Generally, they hold, manage and maintain real estates for investment purposes which are leased to tenants. REITs tend to have a broad shareholder base and are often, but not always, traded on a public stock exchange.

On the basis of proposal made by Assocham, on December 28th 2007, India's market regulator, SEBI proposed setting up of Real Estate Investment Trusts (REITs), by releasing the draft guidelines, paving the way for wider participation by retail investors in the country's booming real estate sector.

The draft includes various prerequisites for any entity to launch a REIT scheme, including the valuation aspect, which has been considered a key roadblock to the launch. The market regulator said every such scheme should appoint an independent property valuer, who will value all the real estate under the scheme after physical inspection. "The valuation methodology shall follow the 'valuation standards on properties' published from time-to-time by the concerned Indian institute or the international valuation standards issued from time-to-time by the International Valuation Standards Committee," the draft proposal said, while listing the requirements of the independent principal valuer.

One of the proposals is that the REIT should be in the form of a trust created under the Indian Trusts Act. Trustees should be either a scheduled bank, trust company of a scheduled bank, public financial institution, insurance company, or a body corporate. A scheme should be launched by a trust and be managed by a real estate investment management company, with both parties having to register with SEBI. Only close-ended schemes can be launched by the trusts, and these schemes have to be listed on the stock exchanges mentioned in the offer document.

On investment limitations, SEBI said a REIT, under all its schemes, should not have exposure to more than 15% of any single real estate project. While it can buy uncompleted units in a building, which is unoccupied and non-income producing or in the course of development, the aggregate contract value of such real estate should not exceed 20% of the total net asset value of the scheme at the time of acquisition, the market regulator said.

Further, it is said REIT, under all its schemes, should not have exposure to more than 25% of all the real estate projects developed, marketed, or financed by the same group of companies. The scheme is prohibited from investing in vacant land or participating in property development activities.

The market regulator has put some restrictions on the borrowing capabilities of a REIT scheme for funding investments and operating expenses. Accordingly, a scheme cannot borrow more than one-fifth of the value of the scheme's total gross assets. While the scheme can mortgage its assets for such borrowings, the REIT should disclose its borrowing policy in its offer document, including its maximum borrowing limit, the draft said. Even credit rating for the scheme is compulsory.

The market regulator said the scheme shall distribute not less than 90% of its annual net profit after tax as dividends every year to unit-holders. "The real estate investment trust shall determine any revaluation surplus credited to income, or gains on disposal of real estate, which shall form part of net income for distribution to unit-holders," the draft proposal said.

END OF CASELET

END OF SECTION B

Section C : Applied Theory (20 Marks)

- | |
|--|
| <ul style="list-style-type: none">• This section consists of questions with serial number 6 – 7.• Answer all questions.• Marks are indicated against each question.• Do not spend more than 25 - 30 minutes on Section C. |
|--|

6. Ideally every investment targets a goal. The goal may be either tangible or intangible. It varies from individual to individual and it also varies at different stages of life for the same individual. Discuss different types of goals of individuals.

[<Answer>](#)

(10 marks)

7. In macroeconomic factor models, the inputs are macroeconomic variables and output is stock return. In this context, discuss the various macroeconomic factors used in Risk Attribute Model (RAM) developed by Solomon Brothers and also enumerate the process for identifying these factors.

[<Answer>](#)

(10 marks)

END OF SECTION C

END OF QUESTION PAPER

Suggested Answers Portfolio Management (CFA640) : July 2008

Section A : Basic Concepts

- | Answer | Reason | |
|--------|--|-------------------------------|
| 1. E | Assumptions mentioned under (a), (b), (c) and (d) are the assumptions specific to CAPM, which Markowitz Model does not assume. | < TOP > |
| 2. E | In case of fully diversified portfolio, total risk = systematic risk
$\sigma_i^2 = \beta^2 \sigma_m^2$ $\beta = \frac{\sigma_i}{\sigma_m}$ Unsystematic risk = 0
Beta of market portfolio = 1
Since unsystematic risk of the portfolio should be zero investment should be only made in market portfolio and risk free assets.
If 160% of funds is invested in market portfolio and 60% of funds is borrowed at T-bill
$\text{Beta of portfolio} = \frac{1.6 \times 1 - 0.6 \times 0}{1} = 1.6$ | < TOP > |
| 3. C | Coefficient of determination = $\frac{\beta^2 \sigma_m^2}{(\beta^2 \sigma_m^2 + \sigma_e^2)}$
$= \frac{\text{Explained Variance}}{\text{Total Variance}}$
$= \frac{(1.35)^2 \times 72}{(1.35)^2 \times 72 + 48} = \frac{131.22}{179.22} = 0.7321$ | < TOP > |
| 4. C | Individualists : They are confident and careful.
Adventurers : They generally go for big bets and for which they have the resources and are willing to take risks
Celebrities : Celebrities are those who are swayed too much by the trend
Guardians : They are both anxious and careful.
Straight Arrows: These are halfway between complete confidence and anxiety, and extreme carefulness and impetuosity. | < TOP > |

5. E Stocks plotting off the security market line provide the evidence of mispricing in the market. In reality there is always bound to be some mispricing because of presence of transaction cost, taxes and information asymmetry. Therefore, in practice, the SML is a band instead of a thin line. [< TOP >](#)

6. D Systematic asset allocation depends on three assumptions. These are- [< TOP >](#)
- The markets provide explicit information about the available returns.
 - The relative expected returns reflect consensus.
 - Expected returns provide clues to actual returns.

7. C If coefficient of correlation between the returns of two stocks A and B is +1 and W_A and W_B is the weighted average of the amount of fund invested in a portfolio of these two stocks. Portfolio risk will be [< TOP >](#)

$$\sigma_p^2 = W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2(+1) W_A W_B \sigma_A \sigma_B$$

$$\sigma_p^2 = (W_A \sigma_A + W_B \sigma_B)^2$$

$$\sigma_p = W_A \sigma_A + W_B \sigma_B$$

8. B The security is overpriced if the required return on the security is greater than the expected return of the security. [< TOP >](#)

9. E A bond swap in which an investor seeks to increase the portfolio's yield to maturity by swapping out of a lower yield bond into a higher yield bond is termed as called Pure Yield Pickup Swap. [< TOP >](#)

10. D [< TOP >](#)

$$\text{Holding period yield} = \frac{(P_{it} - P_{it-1}) + D_t}{P_{it-1}}$$

$$= \frac{(833 - 600) + \frac{400}{100}}{600} \times 100 = 39.50\%$$

11. A An arbitrage portfolio has the following characteristics: [< TOP >](#)

- A zero net initial investment cost.
- A perfectly hedged portfolio position.
- The certainty of a positive value at termination of the position.

Statement I is not correct.

12. B An investment strategy designed to earn a minimum rate of return while allowing the investor to benefit substantially from the positive returns generated by an investment in a risky portfolio is portfolio insurance. [< TOP >](#)

13. B Among the given alternatives, [< TOP >](#)

Buying 6 stocks of C and selling 18 stocks of A gives return of = $6 \times 16 - 8 \times 18 = -48$

Buying 40 stocks of B and selling 20 stocks of C gives return of = $40 \times 12 - 20 \times 16 = 160$

Buying 30 stocks of A and selling 10 stocks of C gives return of = $30 \times 8 - 10 \times 16 = 80$

Buying 20 stocks of C and selling 40 stocks of B gives return of = $20 \times 16 - 40 \times 12 = -160$

Buying 12 stocks of A and selling 8 stocks of B gives return of = $12 \times 8 - 8 \times 12 = 0$.

14. A [< TOP >](#)

$$\text{Risk penalty} = \frac{\text{Total Risk}}{\text{Risk tolerance}}$$

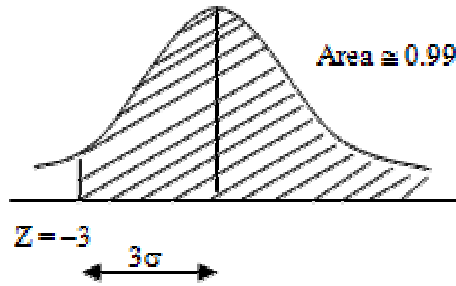
$$= \frac{\sigma_i^2}{R.T} = \frac{(13)^2}{55} = 3.07\%$$

15. C The cost of delivering each bond is shown as follows: [< TOP >](#)
- Bond A = $115.1875 - (100.50 \times 1.144) = 0.2155$
 Bond B = $119.7813 - (100.50 \times 1.1875) = 0.43755$
 Bond C = $114.75 - (100.50 \times 1.141) = 0.0795$
 Bond D = $117.469 - (100.50 \times 1.166) = 0.286$
 Bond E = $115.025 - (100.50 \times 1.143) = 0.1535$
 So, the CTD bond is Bond C.
16. D Liquidity /Flow of funds approach technique uses flow of funds or liquidity data to forecast the changes in general economic scenario. All other alternatives are the properties of leading indicator approach. Hence (d) is the answer. [< TOP >](#)
17. E $50(1 + r) + 6.25(1 + r)^{1/2} = 67.5$ [< TOP >](#)
 At $r = 20\%$, L.H.S. = 66.85
 At $r = 25\%$, L.H.S. = 69.49
 Hence, MWROR = 21.23%.
18. D The risks in hedge fund strategies can be categorized as follows: [< TOP >](#)
- **Non-market, Common Factor Risk:** Non-market, common factor risk lies between the market risk and the security-specific risk and it arises due to the factors common to some securities. Such risks arise due to taking large positions in some specific types of assets.
 - **Market Risk:** Hedge funds reduce market risk but do not eliminate it completely. In a bull market, many funds are unable to resist the excitement to buy heavily in the market using borrowed funds, effectively shifting their focus from security selection to market timing.
 - **Operational Risk:** Operational risk arises due to error in analysis, trading, or recording position. Hedge funds often run very complex portfolios in which capital is often levered, sometimes, heavily, and taking position is difficult in this situation.
 - **Greeks Risk:** This type of risk arises due to changes in the value of option due to changes in the price of securities underlying the option. Additionally, the price of the option may be changed due to other reasons like change in market volatility, change in interest rates, etc. These risks are referred to as Greeks risks as delta, gamma, vega, rho, and theta.
 - **Herd Risk:** Hedge fund managers commonly link themselves with one another. They may share common investment strategies. Thus, the problems of liquidity may arise when a large proportion of managers tend to exit simultaneously.
 - **Security-Specific Risk:** Security-specific risk is generally not very large compared to the capital. It refers to the risk remaining after the removal of effects of common risk factors but it is clearly non-zero. It may be higher if the managers apply leverage to their portfolio.
 - **Liquidity Risk:** Liquidity risk arises due to a very large position in the market compared to the market liquidity. Problems arise when these funds need to exit a large position quickly as it may be unable to do so without affecting the price.
 - **Borrow and Counterparty Risk:** Borrow and counterparty risk refers to the risk default by borrowers or counterparty. This type of risk arises mainly in OTCEI exchange traded fund.
 - **Redemption Risk:** Hedge funds generally are redeemable at specified periods only. Management of funds for redemption amount may force managers to unwind trades at inopportune times. Such risks are commonly known as redemption risks.

19. D $u = \frac{250}{225} = 1.11$ [< TOP >](#)
 $d = \frac{190}{225} = 0.84$
- Probability of price increase $= \frac{R - d}{u - d}$
 $= \frac{1.075 - 0.84}{1.11 - 0.84} = \frac{0.235}{0.27} = 0.87 \text{ (approx)}$
20. E Bond laddering involves buying bonds of different maturities. [< TOP >](#)
21. D The maximum possible loss for an investor who has bought call option is restricted to the option premium amount paid. [< TOP >](#)
22. E Alternative (a) is not correct as it works better over a complete cycle of stock prices. [< TOP >](#)
 Similarly, (b) is not correct, as benefits of DCA are high in the initial periods of starting of the investments.
 Alternative (c) is not correct, as it does not attempt any active investment policy by figuring out the stocks for the purpose.
 Alternative (d) is also not correct because the technique give their best results when undertaken over a long period of time.
23. E A well-managed investment portfolio of any institutional investor must have a portion of its overall investment dedicated to the real estate investment. Given below are five primary reasons to consider real estate for inclusion in an investment portfolio: [< TOP >](#)
- I. To hedge against unexpected inflation or deflation.
 - II. To reduce the overall risk of the portfolio by combining asset classes that respond differently to expected and unexpected events.
 - III. To deliver strong cash flows to the portfolio.
 - IV. To constitute a part of a portfolio that is a reasonable reflection of the overall investment universe.
 - V. To achieve absolute returns well above the risk free rate.
24. C Return from net selectivity [< TOP >](#)
- $$= \left[R_i - (R_f + (R_m - R_f) \frac{\sigma_i}{\sigma_m}) \right]$$
- $$= 14.68 - \left[7.5 + (12.45 - 7.5) \frac{21.62}{15.42} \right] = 0.24\% \text{ (approx)}$$
25. C Liquidity risk refers to the uncertainty of the ability of an investor to exit from an investment when he desires. [< TOP >](#)
26. D Straddle strategy involves buying a call option and a put option at the same exercise price and maturity. Higher break even price = Rs.95 + Rs.8 = Rs.103. Lower break even price = Rs.95 - Rs.8 = Rs.87. [< TOP >](#)

27. D

[< TOP >](#)



Hence, VaR at 99% confidence level = 3σ

in Rupee terms $\text{VaR} = 5175 \times 50 \times \frac{3\sigma}{100} = 23,598$

$$3\sigma = 9.12\%$$

$$\sigma = 3.04\%$$

28. D Sharpe's ratio uses total risk in measuring portfolio performance not systematic risk. [< TOP >](#)

Sharpe's ratio should be used, when we expect substantial presence of unsystematic risk in the portfolios, as it compares total risk or standard deviation with return.

Treynor's ratio should be used when the portfolio is fully diversified, as it considers only systematic risk.

29. C The main characteristics of the information ratio are as follows: [< TOP >](#)

- The information ratio estimates ex-post value added and relates this to ex-ante opportunity available in the future.
- The residual frontier that describes the opportunities accessible to the active manager **is identified by the information ratio.**
- The level of aggressiveness for each manager is decided by his/her information ratio.
- Sometimes intuition can give a good clue about the information ratio and residual risk aversion.
- Value added depends on the managers' prospects and aggressiveness.

30. D Realized return on the portfolio = $(18+15+17)/3 = 16.67\%$ [< TOP >](#)

$$\text{Portfolio beta} = (1.25 + 1.10 + 1.20)/3 = 1.183$$

$$\text{Expected return on the portfolio} = R_f + \beta_p(R_m - R_f) = 7.5 + 1.183(12.5 - 7.5) = 13.42\%(\text{approx})$$

$$\text{Excess return} = (16.67 - 13.42)\% = 3.25\%$$

Section B : Problems/Caselet

1. a. Stock Altastar

R_A (%)	Probability(P)	$E(R_A)$	$R_A - E(R_A)$	$[R_A - E(R_A)]^2$	$R_A - E(R_A)]^2 \times P$
10	0.10	1.00	-4.40	19.36	1.94
12	0.50	6.00	-2.40	5.76	2.88
18	0.30	5.40	3.60	12.96	3.89
20	0.10	2.00	5.60	31.36	3.14
		14.40			$\Sigma=11.85(\%)^2$

Expected Return on Stock Altastar = 14.40%

Standard Deviation (σ) of Stock Altastar = $\sqrt{11.85} = 3.44\%$

Stock Betastar

R_B (%)	Probability(P)	$E(R_B)$	$R_B - E(R_B)$	$[R_B - E(R_B)]^2$	$R_B - E(R_B)]^2 \times P$
8	0.20	1.60	-5.50	30.25	6.05
13	0.30	3.90	-0.50	0.25	0.075
15	0.40	6.00	1.50	2.25	0.90
20	0.10	2.00	6.50	42.25	4.23
		13.50			$\Sigma=11.26(\%)^2$

Expected Return on Stock Betastar = 13.50%

Standard Deviation (σ) of Stock Betastar = $\sqrt{11.26} = 3.36\%$

- b. Expected return on the portfolio constructed by allocating funds between Altastar and Betastar in the ratio of

3 : 2

$$E(r_p) = W_1 E(r_1) + W_2 E(r_2)$$

$$= \frac{3}{5} \times 14.40 + \frac{2}{5} \times 13.50$$

$$= 8.64 + 5.4$$

$$= 14.04\%$$

- c. Risk of the portfolio can be calculated using the following formulae:

$$\sigma_p^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1 w_2 \sigma_1 \sigma_2 \rho_{12}$$

$$= \left(\frac{3}{5} \times 3.44 \right)^2 + \left(\frac{2}{5} \times 3.36 \right)^2 + 2 \times \frac{3}{5} \times \frac{2}{5} \times 3.44 \times 3.36 \times 0.05$$

$$= 6.34 (\%)^2$$

$$\sigma_p = 2.52(\%)$$

2.

- a. Sharpe's measure = $\frac{\overline{rt} - r^*}{\sigma_t}$

Where,

$\overline{rt}$ = Average return on portfolio 't'

r^* = Riskless rate of interest

σ_t = Standard deviation of the returns on portfolio t

$$\text{Treynors' measure} = \beta$$

Where, β = Beta coefficient of portfolio 't'

Portfolio	Sharpe's Index	Ranking on Sharpe's Index	Treynor's Index	Ranking on Treynor's Index
A	0.36	4	6.23	5
B	0.31	5	7.78	4
C	0.095	6	3.48	6
D	0.53	3	9.78	3
E	-3.83	7	-119.79	7

F	0.81	1	17.93	1
G	0.76	2	10.83	2
Market	0.36		5	

Correlation with market × Standard deviation of the Portfolio

Beta = $\frac{\text{Standard deviation of the market}}{\text{Standard deviation of the market}}$

$$A = \frac{0.81 \times 28.0}{14.0} = 1.620$$

$$B = \frac{0.55 \times 18.0}{14.0} = 0.707$$

$$C = \frac{0.38 \times 14.8}{14.0} = 0.402$$

$$D = \frac{0.75 \times 25.7}{14.0} = 1.380$$

$$E = \frac{0.45 \times 3.0}{14.0} = 0.096$$

$$F = \frac{0.63 \times 18.7}{14.0} = 0.842$$

$$G = \frac{0.98 \times 9.5}{14.0} = 0.665$$

- b. Portfolios whose beta is higher relative to their standard deviation have received a lower ranking by Treynor's measure than with the Sharpe's measure.
- c. The return earned by portfolios D, F and G per unit of risk taken as measured by standard deviation (that is Sharpe's measure) is higher than the market portfolio. The same portfolios outperform the market even according to the Treynor's measure, in which beta is considered to be the indicator of risk. The portfolios could outperform the market as they provide a higher return per unit of risk than the market portfolio.

3.a. Portfolio manager, Mr. Vinamra has gone long on 5 contracts of gold futures at Rs.11,567

Initial margin on each contract = Rs.30,000

Therefore, initial margin to be deposited for 5 contracts = Rs.30,000×5 = Rs.1,50,000

Maintenance margin to be maintained = Rs.28,000×5 = Rs.1,40,000.

Day	Settlement price (Rs.)	Opening balance (Rs.)	Profit/ (loss) (Rs.)	Margin call (Rs.)	Closing balance in Margin A/c (Rs.)
0	11,567.00	1,50,000.00			1,50,000.00
1	11,581.54	1,50,000.00	(11581.54-11,567)×10×5 =727.00	--	1,50,727.00
2	11,630.29	1,50,727.00	(11630.29-11581.54)×10×5 = 2437.50	--	1,53,164.50
3	11,617.35	1,53,164.50	(11617.35-11630.29)×10×5 = (647.00)	--	1,52,517.50
4	11,426.85	1,52,517.50	(11,426.85-11,617.35)×10×5 = (9525.00)	--	1,42,992.50
5	11,265.96	1,42,992.50	(11265.96-11426.85)×10×5 = (8044.50)	15,052	1,50,000.00
6	11,306.78	1,50,000	(11,306.78-11,265.96)×10×5 =2041.00	--	1,52,041.00
7	11,410.65	1,52,041.00	(11,410.65-11,306.78)×10×5 = 5193.50	--	1,57,234.50
8	11,598.45	1,57,234.50	(11,598.45-11,410.65)×10×5 = 9390.00	--	1,66,624.50

≤
TOP
≥

Net profit/(loss) = 727.00 + 2437.50 + (647.00) + (9525.00) + (8044.50) + 2041.00 + 5193.50 + 9390.00
= Rs.1572.50

- b. Portfolio manager, Mr. Ayush has gone short on 2 contracts of gold futures at Rs.11,567

Initial margin to be deposited = Rs.30,000 × 2 = Rs.60,000.

Maintenance margin to be maintained = Rs.28,000 × 2 = Rs.56,000

Day	Settlement price (Rs.)	Opening balance (Rs.)	Profit/ (loss) (Rs.)	Margin call (Rs.)	Closing balance in Margin A/c (Rs.)
0	11,567.00	60,000.00			60,000.00
1	11,581.54	60,000.00	(11581.54-11,567)×10×2 = (290.80)	—	59,709.20
2	11,630.29	59,709.20	(11630.29-11581.54)×10×2 = (975.00)	—	58,734.20
3	11,617.35	58,743.20	(11617.35-11630.29)×10×2 = 258.80	--	58,993
4	11,426.85	59,002.00	(11,426.85-11,617.35)×10×2 = 3810.00	—	62,803
5	11,265.96	62812.00	(11265.96-11426.85)×10×2 = 3217.80	—	66,020.80
6	11,306.78	66,029.80	(11,306.78-11,265.96)×10×2 = (816.40)	—	65,204.40
7	11,410.65	65,213.40	(11,410.65-11,306.78)×10×2 = (2077.40)	—	63,127
8	11,598.45	63,136.00	(11,598.45-11,410.65)×10×2 = (3756.00)	—	59,371

Net profit/ (loss) = (290.80) + (975.00) + 258.80 + 3810.00 + 3217.80 + (816.40) + (2077.40) + (3756.00) = Rs.(629).

4. Advantages to retail investors:

REITs can pave the way for retail investors to take share in the growing real estate market, as it is proposed to be on the lines of mutual funds and the minimum investment required for investing in the units of REITs is small. As units of REITs are proposed to be listed on stock exchanges, there is liquidity available on ongoing basis which is not the case with the underlying real estate property. Moreover, investors can enjoy the benefits of intermediary cash flows and capital appreciation. This is because, as per the SEBI draft guidelines, REITs shall distribute at least 90% of the net income generated out of operations to unit holders. And any appreciation in the value of asset will be reflected on NAV. REITs also enable the investors to avoid all the problems associated with owning and maintaining the property, as all these issues are taken care of by the REITs. Moreover, they can serve as the hedge against inflation, as historically it is observed that the rate of price appreciation in property is at or above the rate of inflation. REITs help in widening the capital base for acquiring and developing the property.

Advantages to property markets and economy as well:

As far as the advantages to property markets are considered, the existence of huge amount of stamp duty, registration charges and capital gains on the sale of real estate property induced the players in this market to opt for cash transactions without proper disclosures. These issues led to high incidences of non registration of property transactions. Whenever, units of REITs for which underlying asset is property are publicly traded, the transparency and disclosures in real estate transactions can be improved. REITs create conditions for building integrated property businesses. Most REITs in the leading national markets are internally managed, and have diverse skill bases in property development, redevelopment, acquisitions, divestitures, leasing and management. As such, they can create long-term, value-added ongoing enterprises.

REITs can help attract foreign capital. Transparent, liquid entities such as REITs can help tap into this pool. This can also add to a REIT's financial flexibility. REITs can help develop the broader economy. With the introduction of REITs usually come better transparency and efficiency, and access to stable, global and more competitively priced capital, as well as stronger and more professional property businesses. As such, the commercial property sector can become better positioned to help develop the Indian economy.

5. Establishment as a Trust by banks, insurance companies etc.: As per the SEBI guidelines, REIT should be created as a trust under the Indian Trust Act. The Trusts can be Scheduled banks, insurance companies, body corporates, or public financial institutions. Schemes launched by a Trust will be managed by a real estate investment management company. The rationale behind this can be that as the above mentioned institutions do already have wide client or investor base, the commercialization of this new investment avenue can be easier.

Moreover, the proposal of establishment as a Trust can be to create an assurance that the money contributed by the investment community is in safety hands.

Formation as closed ended schemes: Both the Trustee and the Real Estate Investment Management Company have to be registered with SEBI. The schemes should be launched as closed ended schemes and be listed in stock exchanges. The rationale behind this could be to ensure that there is a sufficient liquidity to the units as well as easy access to small investors. Any capital appreciation or depreciation in the value of assets invested will be reflected in the net asset value of units of REIT

Income distribution: As per the SEBI guidelines, REITs are required to distribute minimum of 90% of their annual income in the form of dividends to unit holders. However, they cannot offer guaranteed returns. The rationale behind this can be to enable that investors are able to receive income on continuous basis, if not guaranteed returns.

Investment norms: The funds collected should be invested in income generating real estate assets and only up to 20 percent of total asset value can be invested in non-income generating and incomplete projects. This is because; they are required to distribute minimum 90 percent of their annual income in the form of dividends to unit holders. SEBI has taken due care for avoiding undue concentration and for ensuring proper diversification of funds, by placing a limit of 15 percent for investment in a single real estate project and 25 percent in real estate projects by a single group.

Compulsory credit rating: To ensure safety, it is made mandatory for REIT to secure a credit rating by a credit rating agency.

Valuation: SEBI proposed for the appointment of independent principal valuer who values all the real estate assets under the scheme once in a year after due physical inspection of all properties. The rationale behind this can be that may not be feasible to conduct the valuation of assets under scheme and to compute NAV on a daily basis, as real estate properties are not publicly traded.

Limits on borrowing capacity: A scheme cannot borrow more than one-fifth of the value of the scheme's total gross assets. Any mortgages for such borrowings should be mentioned in offer document. It is to ensure the undue leverage does not affect the performance of scheme.

Section C: Applied Theory

6. **Near-Term High Priority Goals:** Goals such as saving for improvement of one's own qualification or saving enough to pay the margin for a housing loan are generally very short-term priorities. The individual generally has a high emotional involvement with the achievement of such goals. The emotional involvement generally arises from the fact that, for people with modest resources, the cost of non-achievement of these goals is very high. They generally tend to invest the funds saved for these goals in highly safe and liquid investments. [< TOP >](#)

Long-Term High Priority Goals: The goals that fit into this category are generally like planning for the higher education of a child who is just born, planning to set up a charitable institution after retirement, or achieving financial independence a certain number of years down the line. The goals being long-term, investments are generally made in risky assets of long maturity. It is also common to hold a reasonably diversified portfolio.

Lower Priority Goals: In everyone's life, there are certain goals that one would like to achieve, but do not result in any sort of hardship if they are not achieved. Consider, for example, goals like going on a tour to a foreign country, owning the trendiest color television in the world or owning a house in the wealthiest colony of the city. As these are likely to be beyond the reach of most people in the ordinary course of events, the funds that they save for these goals are generally invested in highly speculative investments. Investments such as these are often made for the fun and thrill of the process than seriously for achieving the goals. It is not uncommon to find investors who allocate a part of their savings to speculative investments.

Money Making Goals: There are some individuals who are not satisfied with the attainment of goals that are suitable to their economic level. They are always in continuous pursuit of avenues for acquiring substantial wealth. They are people with entrepreneurial bent of mind. Such individuals generally invest all they have into a single investment and monitor it carefully. Their risk tolerance is often very high. Therefore, they invest in upcoming companies and wait till the companies grow and then harvest their profits and move on to another company.

7. In the RAM model of Solomon Brothers, the following six macroeconomic factors are used: [< TOP >](#)

Economic growth: The monthly change in industrial production is used, which is measured concurrently with stock returns.

Business cycle: The factor representing the stage of the business cycle is taken as the difference between the yield on top rated corporate bonds of a 20-year maturity and the 20-

year Treasury bonds. The spread between the two falls during economic booms and rises during economic recessions.

Long-term interest rates: The change in the ten-year Treasury yields is taken. This represents the change in relative attractiveness of the financial assets and may cause investors to change the portfolio mix.

Short-term interest rates: The change in the 1-month Treasury bill rate is taken.

Inflation shock: The difference between the expected inflation and the actual inflation is taken. The expected inflation is estimated based on another model developed by the proponents of this model.

Value of the currency: The change in value of the domestic currency is taken, as measured by a trade-weighted basket of currencies.

Apart from these six main factors, there is another factor considered. It is a residual factor, called 'residual market beta' by the proponents of this model. The factor is intended to capture the other macroeconomic factors remaining after considering the above six.

Identification of the factors

The first step for estimating the parameters for the RAM model of Solomon Brothers is to run multiple regression for each stock of the universe being considered. The dependent variable for the regression is the stock return and the independent variables are the above six factors, the residual market beta and other market factors. The statistical significance of each of the factors is studied. Then, for all the stocks in the universe being considered, the factors are standardized.

Standardization involves finding the average and the standard deviation of each of the factors, then calculating the difference between the values of the factors obtained from the regression and the average, and finally dividing the difference with the standard deviation. From the standardized values thus obtained, value lesser than -5 and greater than $+5$ are rejected. This results in values that are too wide away from the mean being rejected.

The standardized multiple regression coefficient of a stock is then taken as the sensitivity of that stock to that macroeconomic factor. If the value of the regression coefficient of a stock for one of the factors is zero, it means that the stock has average sensitivity to that factor. Deviations from zero indicate higher sensitivity to that factor. For example, let us say that a stock has a positive value for change in the value of the domestic currency. It means that, all other things remaining constant, the stock will provide better returns than the market if the value of the domestic currency increases. Similarly, a negative value indicates that, all other things remaining the same, the stock will under perform the market.

[< TOP OF THE DOCUMENT >](#)