

Question Paper

Portfolio Management and Mutual Funds-I (251): October 2006

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. The market price of stock of NATCO Pharma is Rs.102 and its alpha is -1.3% . The realized return on the stock is 16% p.a. 91 day T-bills are currently trading at Rs.98.28. Market risk premium is 7% p.a. What is the required rate of return on the security, if its covariance with the market portfolio declines by 50% ? [< Answer >](#)

- (a) 14.235%
- (b) 13.215%
- (c) 12.165%
- (d) 11.125%
- (e) 10.115%

2. Which of the following is/are **true** regarding trade motivation as explained by Jack Treynor? [< Answer >](#)

- I. The value traders can use time according to their convenience.
- II. The value traders are more sensitive to time, compared to price.
- III. The information traders tend to be less sensitive to time.

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

3. The Sharpe ratio and Treynor ratio of Chola Equity Fund are 0.37 and 4.16 respectively. The risk premium on the fund is 6% . Standard deviation of the fund's return is 11.80% . The standard deviation of the market index's return is 9.56% . Coefficient of determination of the fund approximately is [< Answer >](#)

- (a) 0.58
- (b) 0.64
- (c) 0.72
- (d) 0.81
- (e) 0.92

4. The following is the information pertaining to an open-ended mutual fund scheme.

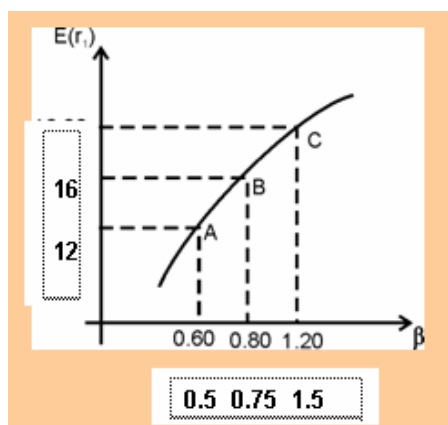
[< Answer >](#)

Particulars	Rs. in million
Value of investments	240.0
Receivables	15.2
Accrued income	5.2
Other current assets	42.5
Liabilities	32.1
Accrued expenses	10.3

If the number of outstanding units is 175 lakh and the public offer price is Rs.15.27, entry load charged by the fund is approximately

- (a) 1.0%
 (b) 1.5%
 (c) 2.0%
 (d) 2.5%
 (e) 3.0%.
5. 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.
6. Convexity of a bond can be viewed as the sensitivity of the
- (a) Duration to the term to maturity
 (b) Market price to the interest rates
 (c) Market price to the duration
 (d) Market price to the term to maturity
 (e) Duration to interest rates.

[< Answer >](#)

7. According to SEBI regulations, which of the following is/are **not true** with respect to the valuation of investments for the purpose of calculation of NAV? [< Answer >](#)

- I. Traded securities are to be valued at the average closing price of the preceding 30 working days on the stock exchange where they are principally traded.
- II. Call money market investments have to be valued at cost plus interest accrued.
- III. Short-term deposits with the banks are to be valued at cost.
- IV. Government securities are to be valued based on the yield at which they are currently traded.
- V. Bills rediscounted have to be valued at cost plus interest accrued.

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

8. The following is the information relating to the standard deviations and correlation coefficients of returns of different securities. [< Answer >](#)

Security	Standard Deviation (%)	Correlation Coefficients				
		A	B	C	D	E
A	15	1.00	0.85	0.75	0.78	0.90
B	26	0.85	1.00	0.78	0.72	0.69
C	28	0.75	0.78	1.00	0.76	0.63
D	18	0.78	0.72	0.76	1.00	0.86
E	15	0.90	0.69	0.63	0.86	1.00

Which of the following combinations of securities minimizes risk?

- (a) Combination of security A and security B
- (b) Combination of security A and security C
- (c) Combination of security B and security E
- (d) Combination of security D and security E
- (e) Combination of security B and security C.

9. The risk, which relates to errors in the execution of transactions, delays in settlement and losses due to counter party default can be called [< Answer >](#)

- (a) Organizational risk
- (b) Portfolio selection risk
- (c) Management process risk
- (d) Securities related risk
- (e) Business risk.

10. Which of the following is/are **not true** with respect to the general guidelines issued by SEBI regarding the investment by mutual funds? [< Answer >](#)

- I. Mutual funds are allowed to invest only in transferable securities traded in money or capital markets including privately placed debentures or securitized debt.
- II. One scheme in a mutual fund is permitted to invest in another scheme under the same AMC.
- III. Mutual funds are not permitted to give term loans for any purpose.

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

11. The beta of a mutual fund is 1.2 and variance of its returns is $225 (\%)^2$. The proportion of its returns not explained by the market is 0.23. The variance on market's return is [< Answer >](#)

- (a) $64(\%)^2$
- (b) $81(\%)^2$
- (c) $100(\%)^2$
- (d) $121(\%)^2$
- (e) $144(\%)^2$.

12. In equity portfolio management, active managers are first hired to add value. However, this creates 'holes' – where lack of equity market coverage exists. The passive fund which is created to fill in these holes is called [< Answer >](#)

- (a) Customized fund
- (b) Factor fund
- (c) Style fund
- (d) Completeness fund
- (e) Arbitrage fund.

13. The rate of return of a portfolio according to Dietz method is 26.24%. The values of the portfolio at the beginning and end of the period are Rs.10,00,000 and Rs.20,00,000 respectively. Net contribution during the period is [< Answer >](#)

- (a) Rs.3,95,156
- (b) Rs.6,52,051
- (c) Rs.7,12,060
- (d) Rs.8,14,261
- (e) Rs.8,45,632.

14. Which of the following is/are **true** with respect to standard deviation and VAR as measures of risk? [< Answer >](#)

- I. Standard deviation has the consistency of calculation among the managers, but VAR does not have.
- II. VAR has common time frame for both return and risk calculation, but standard deviation does not have.
- III. Easy comparability of results is possible in case of standard deviation, but not in case of VAR.

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

15. Consider the following information of the portfolio of a Fund Manager: [< Answer >](#)

Existing	
Market value (Rs.)	750 lakhs
Futures contracts available on index	
Market value	2830
Multiple	100
Present effective duration	6 months

If the number of futures contracts that the fund manager should buy to achieve his targeted effective duration is 398, the targeted effective duration is more than the present effective duration by approximately

- (a) 1 month
- (b) 2 months
- (c) 3 months
- (d) 6 months
- (e) 9 months.

16. For computing the variance of a portfolio consisting of certain number of securities we will have to compute 528 unique covariance terms. The number of variance terms in the portfolio is [< Answer >](#)

(a) 19
(b) 23
(c) 26
(d) 29
(e) 33.

17. The following is the information pertaining to four stocks of a portfolio: [< Answer >](#)

Stock	Beta	Earnings (Rs.)	P/E Multiple
A	0.96	35,000	10
B	0.92	64,000	12
C	1.23	86,000	9
D	1.85	98,000	11

If expected return on the market portfolio is 15% and the risk free rate is 7%, the expected return on the portfolio is

(a) 11.52%
(b) 12.75%
(c) 13.52%
(d) 15.84%
(e) 17.74%.

18. Which of the following statements is/are **true**? [< Answer >](#)

I. Fund with an ExMark of 95% or above may be called an index fund.
II. The usual name for the concept of ExMark is R-squared.
III. For a typical mainstream equity fund, the ExMark usually runs from 30% to 40%.

(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.

19. Preference of a sure gain to an uncertain event with the same expected value as that of a sure outcome, is referred to as [< Answer >](#)

(a) Asset aversion
(b) Loss aversion
(c) Risk aversion
(d) Liability aversion
(e) Emotional constraint.

20. Which of the statements is/are important criticism(s) against the traditional method of performance evaluation? [< Answer >](#)

I. All the performance measurement tools except Sharpe ratio requires identification of a market portfolio.
II. Risk adjusted rate of return based on the ex-post SML or CML tend to favour aggressive portfolios against more conservative ones.
III. CAPM based risk adjusted measures assume a constant portfolio beta.

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

21. A stock with a beta of 0.85 is currently trading at Rs.44. After one year the price of the stock is expected to be Rs.48. The market return is 12% p.a and the risk-free rate is 6% p.a. If stock pays Rs.2.5 as dividend during the next year [< Answer >](#)
- The required return on stock is 11.1% p.a.
 - The stock's alpha is 3.67%.
 - The stock is under priced and should be purchased.
 - The stock is over priced and should be sold.
- Both (I) and (II) above
 - Both (I) and (III) above
 - Both (II) and (III) above
 - Both (II) and (IV) above
 - (I), (II) and (III) above.

22. The current price of NTPC stock is Rs.115 and it is expected that price of the stock may either go up to Rs.128.8 or go down to Rs.97.75. If strike price of call option of NTPC stock is Rs.115 and risk-free rate is 7% p.a. the probability of decrease in stock price is [< Answer >](#)
- 0.4523
 - 0.3971
 - 0.1852
 - 0.1126
 - 0.0951.

23. Duration of a bond portfolio is 8 years and its average YTM is 11.25%. If average YTM increases to 11.60%, the percentage change in the value of the portfolio is [< Answer >](#)
- 1.25%
 - +2.52%
 - +1.25%
 - 2.52%
 - +3.05%.

24. Analysis carried out on the performance of a fund for the last year is compiled as under: [< Answer >](#)

Standard deviation of security returns	14.96%
Standard deviation of market returns	12.50%
Return for extra diversifiable risk	2.45%
Correlation between market return and security return	0.65

The market risk premium is

- 2.21%
 - 5.88%
 - 7.12%
 - 7.69%
 - Insufficient information.
25. An investor has funds 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 >](#)
- Invest 60% of funds in the market portfolio and borrow 160% of funds at risk free rate
 - Invest 160% of funds in a stock with beta of 1.6 and borrow 60% of funds at risk free rate
 - Invest 100% of funds in the market portfolio and borrow 60% of funds at risk free rate
 - Invest 100% of funds in a stock with beta of 1.6 and borrow 60% of funds at risk free rate
 - Invest 160% of funds in the market portfolio and borrow 60% of funds at risk free rate.

26. Which of the following is/are **true** with respect to multi-asset total return policy? [< Answer >](#)
- In this policy, the investor needs to withdraw a certain sum from the portfolio at regular intervals.
 - Under this policy, periodic rebalancing of stocks according to market movement is not possible.
 - It needs constant persuasion to convince that a mixture of individual risky assets may pose less risk than the traditional approaches.
- Only (I) above
 - Only (III) above
 - Both (I) and (II) above
 - Both (I) and (III) above
 - Both (II) and (III) above.
27. Mr. Pranod believes that there will be a big price move for the stock of Mastek, but it is more likely to rise than to fall. He wants to adopt a suitable strategy by using April call and put options with strike price of Rs.340 each. He breaks even when the stock prices are Rs.276 and Rs.372. If the price of each put option is double the price of each call option, each of call and put options are trading respectively at the prices of [< Answer >](#)
- Rs.12 and Rs.24
 - Rs.14 and Rs.28
 - Rs.16 and Rs.32
 - Rs.18 and Rs.36
 - Rs.21 and Rs.42.
28. The total portfolio value of Mr. Sunith is Rs.50,50,000, which consists of equity portfolio and cash equivalents. The beta of the equity portfolio 0.9. The current index futures value is 2380 with a multiple of 200. If he purchases 6 futures contracts to achieve the targeted overall portfolio beta of 1, the proportion of equity portfolio in the entire portfolio is [< Answer >](#)
- 29.16%
 - 32.85%
 - 37.52%
 - 41.26%
 - 48.27%.
29. Who among the following assumes that the term structure of interest rates can provide best information about the rate of expected inflation? [< Answer >](#)
- Markowitz
 - Nelson
 - Fama
 - Sharpe
 - Livingston.
30. In the tax-adjusted CAPM, if the tax rate on dividends is less than tax rate on long term capital gain, which of the following is/are **not true**? [< Answer >](#)
- Investors in higher tax brackets will prefer to hold a higher percentage of low-yield high capital gains stocks.
 - Tax factor is negative.
 - Expected pre-tax return is an increasing function of the dividend yield.
- Only (II) above
 - Only (III) above
 - Both (I) and (II) above
 - Both (I) and (III) above
 - Both (II) and (III) above.

END OF SECTION A

Section B : Problems (50 Marks)

- This section consists of questions with serial number 1 – 5.
- Answer **all** questions.
- Marks are indicated against each question.
- Detailed workings 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 the NAVs of SBI Magnum Index Fund and the values of NSE Nifty.

[< Answer >](#)

Period	NAVs of SBI Magnum Index Fund (Rs.)	NSE Nifty
29/07/05	21.1935	2312.30
31/08/05	21.8465	2384.65
30/09/05	23.8691	2601.40
31/10/05	21.7705	2370.95
30/11/05	24.0993	2652.25
30/12/05	25.5453	2836.55
31/01/06	27.0237	3001.10
28/02/06	27.6589	3074.70
31/03/06	30.4901	3402.55
28/04/06	31.7152	3557.60
31/05/06	28.4371	3071.05
30/06/06	29.0702	3128.20
31/07/06	29.2275	3143.20

You are **required** to compute the annualized tracking error of SBI Magnum Index Fund.

(8 marks)

2. The utility function for different investors of a portfolio consisting of both equity and T-Bills is $U = E(r) - 0.16Q\sigma^2$.

[< Answer >](#)

Where, $E(r)$ = Expected return from portfolio

Q = Risk aversion of an investor holding the portfolio

σ^2 = Variance of returns on portfolio

The probabilities associated with the returns from the investment in equity are as follows.

Probability	Returns (%)
0.20	30
0.10	8
0.24	18
0.16	22
0.30	12

If 180 day T-bills are presently trading at Rs.96.36, you are **required** to determine the proportions of investment to be made in equity and T-Bills to maximize the utilities of the investors with different risk aversions as below:

- i. Mr. Sukesh : 1
- ii. Ms. Utpala : 3
- iii. Mr. Akash : 5

(9 marks)

3. Mr. Jain has zeroed in on the following stocks with the parameters given below:

[< Answer >](#)

Stock	Variance of Stock (%) ²	Excess Return to Beta	Proportion of returns not explained by the market
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ONGC	42.20	2.36	0.1620
Oriental Bank	36.60	1.03	0.2396
Bajaj Auto	38.08	8.05	0.2162
HPCL	28.20	8.96	0.1120
Tata Tea	32.88	8.15	0.1926

The variance of returns on market is $32(\%)^2$.

You are **required** to construct an optimum portfolio using the Sharpe's optimization method.

(12 marks)

4. Mr. Dikshit is planning to invest in the balanced portfolio of a pension fund to be effective from 1st January 2007, and to be managed by Mr. Sravan. Mr. Sravan is planning to invest 25% of his portfolio in government securities, 40% of his portfolio in equity portfolio and the remaining 35% of his portfolio in corporate bonds. On January 1st 2007, the pension fund is expected to have the following liabilities to be paid in different years at the end of each year.

[< Answer >](#)

(Rs. in crore)

Year	Liabilities
3	13,00,000
4	26,00,000
5	24,00,000
6	10,00,000
7	12,00,000
8	10,00,000
9	23,00,000
10	21,00,000
11	22,00,000
12	21,00,000

From 13th year onwards, the pension fund has the liability of Rs.8,20,000 p.a. in perpetuity.

The cost of such liabilities in the market is expected to be 13.5% p.a.

Mr. Sravan is planning to rebalance his portfolio at the beginning of every year, to immunize the above liabilities. The worth of the portfolio on January 1st 2007 is expected to be Rs.100 cr, which will include the investment in the following instruments.

Instruments	Face Value of each security/unit/bond (Rs.)
Equity Portfolio	10
8.2% CG 2009	1000
10.5% Birla 2010	1000
11.1% ACC 2011	1000

All the bonds are to mature at the end of year of their respective maturity years.

On January 1st 2007, each unit of equity portfolio is expected to trade at Rs.54. Expected dividend ratio on equity portfolio is 40%.

On January 1st 2007, the pattern of yield curve is expected to be as follows:

Years to maturity	1	2	3	4	5	6	7	8	9	10
Yield (%)	6.40	6.79	6.88	7.20	7.56	7.72	7.94	8.16	8.45	8.6

The yield curve is expected to remain the same even in future.

You are **required** to determine

- The proportion of investment to be made by Mr. Sravan in each of the

instruments as on January 1st 2007.

- b. The value of portfolio on January 1st 2008 before rebalancing.

(9 + 4 =13 marks)

5. An investor has written call options on Syndicate Bank stocks, the underlying value of which is at Rs.50 lakh. The beta of Syndicate Bank stock is 1.43 and delta of the option on that stock is 0.86. Expecting an increase of 5% in NSE Nifty, the investor is considering hedging his position using Nifty futures. Nifty futures are currently trading at 3364 and the contract multiplier is 100. You are **required** to compute the number of futures contracts the investor should buy/sell to hedge his position.

[< Answer >](#)

(8 marks)

END OF SECTION B

Section C : Applied Theory (20 Marks)

- 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. Risk-adjusted performance measures are always criticized for their inability to analyze properly the performance of portfolios. Discuss briefly some important criticism leveled against these measures.

[< Answer >](#)

(10 marks)

7. Asset allocation should be dynamic and at the same time it should be integrated. Depending on the process of asset allocation, there can be various approaches of asset allocation. Discuss the popular approach of asset allocation.

[< Answer >](#)

(10 marks)

END OF SECTION C

END OF QUESTION PAPER

Suggested Answers

Portfolio Management and Mutual Funds-I (251): October 2006

Section A : Basic Concepts

1. Answer : (c)

[< TOP >](#)

Reason: Risk free rate = $(100-98.28)/98.28 \times 365/91 \times 100 = 7.02\%$

Market return = $7.02 + 7 = 14.02\%$

Required rate of return = $16 + 1.3 = 17.3\%$

$$= 7.02 + 7 \times \beta = 17.3\%$$

$$\text{Beta} = 1.46857 \sim 1.47$$

If covariance of stock with the market declines by 50%, its beta also declines by 50%. Hence, new beta = 0.735.

Required rate of return = $7.02 + 0.735 \times 7 = 12.165\%$

2. Answer : (a)

[< TOP >](#)

Reason: According to Jack Treynor, key motives for trading are value, information and cash flow. The value traders can use time according to their convenience so that by extending the time of trading, they can reduce the cost of trading. Information traders tend to be more sensitive to time.

3. Answer : (c)

[< TOP >](#)

$$\text{Reason : } \frac{\text{Treynor - ratio}}{\text{Sharpe ratio}} = \frac{\frac{R_i - R_F}{\beta}}{\frac{R_i - R_F}{\sigma_i}} = \frac{\sigma_i}{\beta} = \frac{4.16}{0.37}$$

$$= \frac{\sigma_i}{\beta} = 11.24\%$$

$$\sigma_i = 11.8\%$$

$$\beta = 1.05$$

$$\text{Systematic risk of the fund} = \sigma_m^2 \times \beta^2 = 9.56^2 \times 1.05^2 = 100.76(\%)^2$$

$$\text{Coefficient of determination} = 100.76/11.8^2 = 0.7236.$$

(OR)

$$\beta = \frac{\sigma_i \sigma_m \rho_{im}}{\sigma_m^2} = \frac{11.8 \times 9.56 \times \rho_{im}}{9.56^2} = 1.05$$

$$\rho_{im} = 0.85$$

$$\rho_{im}^2 = 0.7225.$$

4. Answer : (d)

[< TOP >](#)

Reason:

$$\begin{aligned} \text{NAV of the fund unit} &= \frac{240.0 + 15.2 + 5.2 + 42.5 - 32.1 - 10.3}{17.5} \\ &= 14.89 \end{aligned}$$

$$\text{The public offer price (POP)} = \frac{14.89}{1 - X} = \text{Rs. } 15.27$$

$$X = 2.5\%.$$

5. Answer : (b) [< TOP >](#)
Reason : Among the given alternatives,
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 $= 12 \times 8 - 8 \times 12 = 0$.
6. Answer : (e) [< TOP >](#)
Reason: Duration is a measure of the approximate sensitivity of a bond's value to rate changes. Duration is infact a first (linear) approximation for small change in interest rates. The approximation can be improved by using second approximation. This approximation is referred as convexity. Therefore, convexity can be viewed as sensitivity of duration to interest rates.
7. Answer : (b) [< TOP >](#)
Reason: For the purpose of calculation of NAV, the investments are to be valued as follows.
i. Traded securities are to be valued at the last quote closing price on the stock exchange where it is principally traded.
ii. Investment in call money, bills rediscounted and short-term deposits with banks are to be valued at cost plus interest accrued.
iii. Other money market instruments are to be valued based on the yield at which they are currently traded.
iv. Government securities are to be valued based on the prevailing yield to maturity.
8. Answer : (e) [< TOP >](#)
Reason: Risk minimization is possible, when $\rho_{im} < \frac{\sigma_1}{\sigma_2}$ where, $\sigma_1 < \sigma_2$. Combination between B and C gives
the same, as $0.78 < \frac{26}{28}$.
9. Answer : (c) [< TOP >](#)
Reason: The risk, which relates to errors in the execution of transactions, delays in settlement and losses due to counter party default can be called management process risk.
10. Answer : (b) [< TOP >](#)
Reason: Mutual funds are allowed to invest only in transferable securities traded in money or capital markets including privately placed debentures or securitized debt. No scheme in a mutual fund is permitted to invest in another scheme under the same AMC. Mutual funds are not permitted to give term loans for any purpose.
11. Answer : (d) [< TOP >](#)
Reason : The proportion of returns explained by the market $= 1 - 0.23 = 0.77$
Correlation with the market $= 0.88$
Beta $= (\text{S.D of Mutual Fund return} \times \text{Correlation with the market}) / \text{S.D of Market return}$
 $= (15 \times 0.88) / \text{S.D of market return} = 1.2$
S.D of market return $= 11\%$ Variance of market return $= 121(\%)^2$.
12. Answer : (d) [< TOP >](#)
Reason: The passive strategy to fill in these holes completes the desired coverage and hence it is called completeness fund.

13. Answer : (b) [< TOP >](#)

$$\begin{aligned}\text{Reason: } R_i &= \frac{[20,00,000 - 0.5 \times \text{Net contributions}]}{[10,00,000 + 0.5 \times \text{Net contributions}]} - 1 \times 100 \\ &= 26.24\% \\ &= \text{Net contributions} = \text{Rs.} 6,52,051.\end{aligned}$$

14. Answer : (d) [< TOP >](#)

Reason: Standard deviation has the consistency of calculation among the managers, but VAR does not have. Standard deviation has common time frame for both return and risk calculation, but VAR does not have. Easy comparability of results is possible in case of standard deviation, but not in case of VAR.

15. Answer : (e) [< TOP >](#)

Reason : The approximate number of contracts (X) necessary to achieve the targeted duration for the portfolio is given by;

$$X = \frac{(D_T - D_I) P_I}{D_F P_F}$$

Where X = Approximate number of futures contracts

D_T = Target effective duration for the portfolio

D_I = Initial effective duration of the portfolio

P_I = Initial market value of the portfolio

D_F = Effective duration of the futures contract

P_F = Market value of the futures contract

$$X = \frac{(D_T - D_I) 750}{0.5 \times \frac{2830 \times 100}{1,00,000}} = 398 \text{ contracts}$$

$$(D_T - D_I) = 0.75089 \text{ 0.75 years or 9 months.}$$

16. Answer : (e) [< TOP >](#)

Reason : Number of unique covariances = $n(n-1) / 2 = 528$.

$$(n^2 - n) / 2 = 528$$

$$n^2 - n = 1056$$

$$n^2 - n - 1056 = 0$$

$$n^2 - 33n + 32n - 1056 = 0$$

$$n(n-33) + 32(n-33) = 0$$

$$(n-33)(n+32) = 0$$

$$n = 33 \text{ or } n = -32$$

Since the existence of negative number of shares is not possible,
 $n = 33$.

17. Answer : (e) [< TOP >](#)

Reason: With average beta of the portfolio

$$0.96 \times \frac{3,50,000}{29,70,000} + 0.92 \times \frac{7,68,000}{29,70,000} \\ + 1.23 \times \frac{7,74,000}{29,70,000} + 1.85 \times \frac{10,78,000}{29,70,000}$$

$$= 1.343$$

$$\begin{aligned} \text{Expected returns} &= 7 + 1.343 (15 - 7) \\ &= 17.74\% \end{aligned}$$

18. Answer : (c) [< TOP >](#)

Reason: Funds with an ExMark of 95% or above may be called an index fund. The usual name for the concept of ExMark is R-squared. For a typical mainstream equity fund, the ExMark usually runs from 80% to 90%.

19. Answer : (c) [< TOP >](#)

Reason: Preference of a sure gain to an uncertain event with the same expected value as that of a sure outcome, is referred to as risk aversion.

20. Answer : (d) [< TOP >](#)

Reason: Treynor's ratio, Jensen's alpha and Fama's selectivity model require value of market portfolio's return and risk to measure the performance of the portfolio. All the risk-adjusted measures based on the ex-post SML, CML estimates return per unit of risk and therefore aggressive portfolio with higher risk may be ranked below conservative portfolio. Again CAPM based risk adjusted measure assume a constant portfolio beta. (I) and (III) are correct and (d) is the answer.

21. Answer : (e) [< TOP >](#)

$$\text{Reason: Expected return} = \frac{48 - 44 + 2.5}{44} = 14.77\%$$

$$\text{Required rate of return} = 6 + 0.85 (12 - 6) = 11.1\%$$

$$\text{alpha} = 14.77 - 11.1 = 3.67\%$$

As alpha is positive the stock is under priced and should be purchased.

22. Answer : (c) [< TOP >](#)

$$\text{Reason: } u = \frac{128.8}{115} = 1.12$$

$$d = \frac{97.75}{115} = 0.85$$

$$\text{Probability of price increase} = \frac{R - d}{u - d}$$

$$= \frac{1.07 - 0.85}{1.12 - 0.85} = \frac{0.22}{0.27} = 0.8148$$

$$\text{Probability of price decrease} = 1 - 0.8148 = 0.1852.$$

23. Answer : (d) [< TOP >](#)

Reason: Change in YTM = $11.60 - 11.25 = 0.35\%$

$$\text{Change in price of the bond} = -\frac{8}{1.1125} \times 0.35 = -2.52\%.$$

24. Answer : (b) [< TOP >](#)

Reason: Total selectivity – Net selectivity

$$= [R_A - \{R_f + \beta_A (R_m - R_f)\}] - \left[R_A - \left\{ R_f + (R_m - R_f) \frac{\sigma_A}{\sigma_m} \right\} \right]$$

$$2.45\% = (R_m - R_f) \left[\frac{\sigma_A}{\sigma_m} - \beta_A \right]$$

$$\beta_A = (\sigma_A \rho_{AM}) / \sigma_m = 0.78$$

$$= (R_m - R_f) \left[\frac{14.96}{12.5} - 0.78 \right] = 2.45$$

$$(R_m - R_f) 0.4168 = 2.45\% \\ = 5.88\%.$$

25. Answer : (e) [< TOP >](#)

Reason: 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

$$\text{Beta of portfolio} = \frac{1.6 \times 1 - 0.6 \times 0}{1} \\ = 1.6$$

26. Answer : (d) [< TOP >](#)

Reason: In this policy, the investor needs to withdraw a certain sum from the portfolio on regular intervals so that something in the portfolio is left over for further growth. The periodic rebalancing of stocks with market movement tends to keep the stocks well within acceptable ranges. It needs constant persuasion to convince that a mixture of individual risky assets may pose less risk than the traditional approaches.

27. Answer : (c)

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Reason: Suitable strategy when the stock prices are expected to rise than to fall is strap, which consists of buying two call and buying one put at the same strike price. When the strike price is Rs.340, and he is able to break even when stock prices are Rs.276 and Rs.372. The difference between high stock price and strike price is Rs.32. The difference between strike price and lower stock price is Rs.64. Call option is trading at Rs.16 and put option is trading at Rs.32.

Exercise Price – Lower BEP Price = Initial Investment

(Or)

Higher BEP Price – Exercise Price = Initial Investment/2

$340 - 276 = \text{Rs.}64$

$2C + P = \text{Rs.}64$

Since the price of each put option is double the price of each call option, $P = 2C$

$2C + 2C = \text{Rs.}64$

$4C = \text{Rs.}64$

$C = \text{Rs.}16$

$P = 64 - 2 \times 16 = \text{Rs.}32$

28. Answer : (e)

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Reason: $F_e \times \beta_e + F_c \times \beta_c + F_f \times \beta_f = F_p \beta_p$

Where F_e, F_c, F_f & F_p are the funds of equity, cash, Index futures and the portfolio respectively.

$\beta_e, \beta_c, \beta_f$ & β_p are beta's of equity cash, Index futures & portfolio respectively.

Let X be the investment in equity portfolio,

$X \times 0.9 + (50,50,000 - X) \times 0 + 2380 \times 200 \times 6 = 1 \times 50,50,000$

$0.9X + 28,56,000 = \text{Rs.}50,50,000$

$0.9X = \text{Rs.}21,94,000$

$X = 24,37,778$

Proportion of equity portfolio = $24,37,778 / 50,50,000 = 0.4827 = 48.27\%$.

29. Answer : (c)

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Reason: Fama assumes that the term structure of interest rates can provide best information about the rate of expected inflation.

30. Answer : (d)

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Reason: Tax factor = $\frac{T_d - T_g}{1 - T_g}$, where T_d = Tax rate on dividend, T_g = Tax rate on capital gain.

From the above equation, if tax rate on dividend yield is less than tax rate on capital gains, tax factor is negative. When tax factor is positive, investors in higher tax brackets will prefer to hold a higher percentage of low-yield high capital gains stocks to maximize their post-tax return and expected pre-tax return will be an increasing function of the dividend yield. When tax factor is negative, vice versa.

Section B : Problems

1.

	R_{SBI}	R_{Nifty}	$(R_{SBI} - R_{Nifty})$	$(R_{SBI} - R_{Nifty}) - \overline{(R_{SBI} - R_{Nifty})}$	$(R_{SBI} - R_{Nifty}) - \overline{(R_{SBI} - R_{Nifty})}^2$
31/08/05	3.08	3.13	-0.05	-0.115	0.013225
30/09/05	9.26	9.09	0.17	0.105	0.011025
31/10/05	-8.79	-8.86	0.07	0.005	0.000025
30/11/05	10.70	11.86	-1.16	-1.225	1.500625
30/12/05	6.00	6.95	-0.95	-1.015	1.030225
31/01/06	5.79	5.80	-0.01	-0.075	0.005625
28/02/06	2.35	2.45	-0.10	-0.165	0.027225
31/03/06	10.24	10.66	-0.42	-0.485	0.235225
28/04/06	4.02	4.56	-0.54	-0.605	0.366025
31/05/06	-10.34	-13.68	3.34	3.275	10.725625
30/06/06	2.23	1.86	0.37	0.305	0.093025
31/07/06	0.54	0.48	0.06	-0.005	0.000025
Total			0.78		14.0079
Average			0.065		

$$\text{Tracking error} = \sqrt{14.0079/11} = 1.128\%$$

$$\text{Annualized tracking error} = 1.128 \times \sqrt{12} = 3.91\%$$

Another Method :

	R_{SBI}	R_{Nifty}	$(R_{SBI} - \overline{R_{SBI}})$	$(R_{SBI} - \overline{R_{SBI}})^2$	$(R_{Nifty} - \overline{R_{Nifty}})$	$(R_{Nifty} - \overline{R_{Nifty}})^2$	$(R_{SBI} - \overline{R_{SBI}}) - (R_{Nifty} - \overline{R_{Nifty}})$
08/05	3.08	3.13	0.16	0.0256	0.27	0.0729	0.0432
09/05	9.26	9.09	6.34	40.1956	6.23	38.8129	39.4982
10/05	-8.79	-8.86	-11.71	137.1241	-11.72	137.3584	137.2412
11/05	10.70	11.86	7.77	60.5284	9.00	81.00	70.02
12/05	6.00	6.95	3.08	9.4864	4.09	16.7281	12.5972
01/06	5.79	5.80	2.87	8.2369	2.94	8.6436	8.4378
02/06	2.35	2.45	-0.57	0.3249	-0.41	0.1681	0.2337
03/06	10.24	10.66	7.31	53.4824	7.80	60.84	57.096
04/06	4.02	4.56	1.10	1.21	1.70	2.89	1.87
05/06	-10.34	-13.68	-13.26	175.8276	-16.54	273.5716	219.3204
06/06	2.23	1.86	-0.70	0.4761	-1.00	1.00	0.69
07/06	0.54	0.48	-2.38	5.6644	-2.38	5.6644	5.6644

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Total				492.6824		626.75	552.7121
Average							
Variance (Total/11)				44.79		56.98	50.25

$$\text{Beta} = 50.25/56.98 = 0.88$$

$$\text{Residual Risk} = \sigma_{\text{SBI}}^2 - \beta^2 \times \sigma_{\text{Nifty}}^2 = 44.79 - 0.88^2 \times 56.98 = 0.66$$

$$\text{Tracking error} = [(\beta_{\text{SBI}} - 1)^2 \sigma_{\text{NIFTY}}^2 + \sigma_{\text{eSBI}}^2]^{1/2} = [(0.88 - 1)^2 \times 56.98 + 0.66]^{1/2} = 1.21\%$$

$$\text{Annualized tracking error} = 1.21 \times \sqrt{12} = 4.19\%$$

The deviation in both the methods is due to approximation.

2. Expected return and standard deviation from equity

Probability	Return (%)	Return × Prob (%)	$[(r_e) - E(r_e)]^2$	Prob $[(r_e) - E(r_e)]^2$
0.20	30	6	11.76	27.66
0.10	8	0.8	-10.24	10.49
0.24	18	4.32	-0.24	0.01
0.16	22	3.52	3.76	2.26
0.30	12	3.6	-6.24	11.68
		18.24		Variance = 52.1 (%) ²
				Standard Deviation = 7.22(%)

$$\text{Expected Return on portfolio } E(r) = W_e E(r_e) + W_{rf} R_f$$

By simplification,

$$E(r) = R_f + W_e [E(r_e) - R_f]$$

$$\text{Standard Deviation on portfolio } \sigma = W_e \sigma_e \text{ (Since } \sigma_{rf} \text{ is zero)}$$

$$\text{or } \sigma^2 = W_e^2 \sigma_e^2$$

The investor can maximize his utility level, U, by making the best allocation to the risky asset.

As per the utility function,

$$U = E(r) - 0.16Q \sigma^2$$

$$U = [R_f + W_e [E(r_e) - R_f]] - 0.16 Q W_e^2 \sigma_e^2$$

Maximization of the utility can be solved by setting the derivative of the above equation to zero, with respect to the proportion of investment in equity W_e

Max U

$$\frac{\partial U}{\partial W_e} = R_f + W_e [E(r_e) - R_f] - 0.16 Q W_e^2 \sigma_e^2$$

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$$= [E(r_e) - R_f] - 0.32Q W_e \sigma_e^2 = 0$$

$$= [E(r_e) - R_f] = 0.32Q W_e \sigma_e^2$$

$$W_e = [E(r_e) - R_f] / 0.32Q \sigma_e^2$$

$$\text{Return on T-Bills} = [(100 - 96.36) / 96.36] \times 365 / 180 \times 100 = 7.66\%$$

For investor, Mr. Sukesh with risk aversion of 1, proportion of investment:

$$W_e = [E(r_e) - R_f] / [0.32Q \sigma_e^2]$$

$$= [18.24 - 7.66] / [0.32 \times 1 \times 52.1] = 0.6346 = 63.46\%$$

$$W_e = 63.46\% \text{ and } W_f = 36.54\%$$

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$$= [18.24 - 7.66] / [0.32 \times 3 \times 52.1] = 0.2115 = 21.15\%$$

$$W_e = 21.15\% \text{ and } W_f = 78.85\%$$

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$$= [18.24 - 7.66] / [0.32 \times 5 \times 52.1] = 0.1269 = 12.69\%$$

$$W_e = 12.69\% \text{ and } W_f = 87.31\%$$

3.

Stock	Variance (%) ²	Proportion of Unsystematic Risk	Proportion of Systematic Risk	Systematic Risk (%) ²	Unsystematic Risk (%) ²	β^2	β	$(R_i - R_f) / \beta$	$(R_i - R_f)$
	1	2	3	1*3 = 4	1*2 = 5	4 / Market Variance = 6	7	8	8* 7 = 9
ONGC	42.20	0.162	0.838	35.36	6.84	1.11	1.05	2.36	2.48
Oriental Bank	36.60	0.2396	0.7604	27.83	8.77	0.87	0.93	1.03	0.96
Bajaj Auto	38.08	0.2162	0.7838	29.85	8.23	0.93	0.97	8.05	7.81
HPCL	28.20	0.112	0.888	25.04	3.16	0.78	0.88	8.96	7.88
Tata Tea	32.88	0.1926	0.8074	26.55	6.33	0.83	0.91	8.15	7.42

Stock	$(R_i - R_f) / \beta_i$	Rank
ONGC	2.36	4
Oriental Bank	1.03	5
Bajaj Auto	8.05	3
HPCL	8.96	1
Tata Tea	8.15	2

Rank	Stock	σ_{ei}^2	β_i	$R_i - R_f$	$(R_i - R_f) \times \beta_i$	$(R_i - R_f) \beta_i / \sigma_{ei}^2$
1	HPCL	3.16	0.88	7.88	6.93	2.1900
2	Tata Tea	6.33	0.91	7.42	6.75	1.0660
3	Bajaj Auto	8.23	0.97	7.81	7.58	0.9210

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4	ONGC	6.84	1.05	2.48	2.61	0.3801
5	Oriental Bank	8.77	0.93	0.96	0.90	0.1026

Stock	$(R_i - R_f) / \beta_i$	$\frac{(R_i - R_f)\beta_i}{\sigma_{ei}^2}$	$\frac{\beta_i^2}{\sigma_{ei}^2}$	$\Sigma \frac{(R_i - R_f)\beta_i}{\sigma_{ei}^2}$	$\Sigma \frac{\beta_i^2}{\sigma_{ei}^2}$	$C_i = \frac{\sigma_m^2 \Sigma \frac{(R_i - R_f)\beta_i}{\sigma_{ei}^2}}{1 + \sigma_m^2 \Sigma \frac{\beta_i^2}{\sigma_{ei}^2}}$
HPCL	8.96	2.190	0.2451	2.1900	0.2451	7.9247
Tata Tea	8.15	1.0660	0.1310	3.2560	0.3761	7.9931
Bajaj Auto	8.05	0.9210	0.1143	4.1770	0.4904	8.0072
ONGC	2.36	0.3801	0.1612	4.5571	0.6516	6.6736
Oriental Bank	1.03	0.1026	0.0986	4.6597	0.7502	5.9629

$$C^* = 8.0072 \sim 8.01$$

$$Z_i = \frac{\beta_i}{\sigma_{ei}^2} \left(\frac{R_i - R_f}{\beta_i} - C^* \right)$$

$$Z_{HPCL} = \frac{0.88}{3.16} (8.96 - 8.01) = 0.2646$$

$$Z_{Tatatea} = \frac{\beta_i}{\sigma_{ei}^2} \left(\frac{R_i - R_f}{\beta_i} - C^* \right)$$

$$= \frac{0.91}{6.33} (8.15 - 8.01) = 0.0201$$

$$Z_{BajajAuto} = \frac{0.97}{8.23} (8.05 - 8.01) = 0.0047$$

$$Z_i = 0.2646 + 0.0201 + 0.0047 = 0.2894$$

$$\%_{HPCL} = \frac{0.2646}{0.2894} = 0.9143 = 91.43\%$$

$$\%_{Tatatea} = \frac{0.0201}{0.2894} = 0.06945 = 6.945\%$$

$$\%_{Bajajauto} = \frac{0.0047}{0.2894} = 0.01624 = 1.624\%$$

4. a. Duration of bonds and equity

Duration of 8.2% CG 2009

		At 6.88%	
1	82	76.72	76.72
2	82	71.78	143.57
3	1082	886.21	2658.64
		1034.72	2878.93
Duration			2.78 years

Duration of 10.5% Birla 2010

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		At 7.2%	
1	105	97.95	97.95
2	105	91.37	182.74
3	105	85.23	255.70
4	1105	836.73	3346.90
		1111.28	3883.29
Duration			3.49 years

Duration of 11% ACC 2011

Years		At 7.56%	
1	111	103.20	103.20
2	111	95.94	191.89
3	111	89.20	267.60
4	111	82.93	331.73
5	1111	771.72	3858.60
		1143.00	4753.02
Duration			4.16 years

Dividend yield = Dividend/Market price = 4/54 = 7.41

Duration of equity = 1/Dividend Yield = 1/0.0741 = 13.5 years

Duration of liabilities

Years		Terminal value	@ 13.5%		
3	1300000		0.684	889110.56	2667331.68
4	2600000		0.603	1566714.64	6266858.56
5	2400000		0.531	1274183.37	6370916.87
6	1000000		0.468	467761.88	2806571.31
7	1200000		0.412	494550.01	3461850.07
8	1000000		0.363	363105.73	2904845.88
9	2300000		0.320	735808.98	6622280.8
10	2100000		0.282	591916.82	5919168.18
11	2200000		0.248	546346.55	6009812.04
12	2100000		0.219	459482.48	5513789.76
13	820000	820000/0.135 = 6074074.074	0.219	1329014.58	15948175
				8717995.61	64491600.1
				Duration	7.4 years

$$2.78 \times 0.25 + 3.49x + 4.16 \times (0.35 - x) + 0.4 \times 13.5 = 7.4$$

$$x = 0.225$$

Proportion of investment in 8.2% 2009 CG = 0.25

Proportion of investment in 10.5% 2010 Birla = 0.225

Proportion of investment in 8.2% 2011 ACC = 0.125

Proportion of investment in Equity portfolio = 0.4

Investment in 8.2% 2009 CG = 0.25 × Rs.100 cr = Rs.25 crore

Investment in 10.5% 2010 Birla = 0.225 × Rs.100 cr = Rs.22.5 crore

Investment in 8.2% 2011 ACC = 0.125 × Rs.100 cr = Rs.12.5 crore

Investment in Equity portfolio = 0.4 × Rs.100 cr = Rs.40 crore

Number of 8.2% 2009 CG bonds = Rs.25 crore /Rs.1034.72 = 2,41,611.2572 ~ 2,41,611

Number of 10.5% 2010 Birla bonds = Rs.22.5 crore /Rs. 1111.28 = 2,02,469.225 ~ 2,02,469

Number of 11.1% 2011 ACC bonds = Rs.12.5 crore /Rs. 1143.00 = 1,09,361.33 ~ 1,09,361

Number of units of equity portfolio = Rs.40 crore /Rs.54 = 74,07,407.41 ~ 74,07,407

b. The value of portfolio as on January 1st 2008, before rebalancing

Price of 8.2% CG 2009 = 82 PVIF (6.79%, 1) + 1082 PVIF (6.79%, 2)

$$= 76.79 + 948.78 = \text{Rs.}1025.57$$

Price of 10.5% Birla 2010 = 105 PVIFA (6.88%, 2) + 1105 PVIF (6.88%, 3)

$$= 190.16 + 905.05 = \text{Rs.}1095.21$$

Price of 11% ACC 2011 = 111 PVIFA (7.2%, 3) + 1111 PVIF (7.2%, 4)

$$= 290.24 + 841.27 = \text{Rs.}1131.51$$

The value of portfolio before rebalancing:

$$2,41,611 \times 1025.57 +$$

$$2,02,469 \times 1095.21 + 1,09,361 \times 1131.51 + 74,07,407 \times 64.8 = \text{Rs.}107,32,78,105$$

5. Since the investor has written call option he will lose if market goes up. If Nifty goes up by 5%, the value of Syndicate bank stock would increase by

$$= 1.43 \times 0.05 = 7.15\%$$

Or value of the stock will rise by $0.0715 \times 50,00,000$

$$= \text{Rs.}3,57,500$$

As the option delta is 0.86. The value of options would increase by

$$= 0.86 \times 3,57,500$$

$$= \text{Rs.}3,07,450$$

Futures price will also increase because of 5% rise in the market.

Futures price would increase by $3364 \times 0.05 = 168.2$ per contract

Gain in futures contract to the buyer = $168.2 \times 100 = \text{Rs.}16,820$

In case of 5% rise in the market, investor is likely to lose Rs.3,07,450 from his exposure to options. Therefore, he should buy market index futures

$$= \frac{3,07,450}{16,820} = 18.2788$$

$$= 18 \text{ contracts.}$$

Investor has to buy 18 Nifty futures contracts.

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Section C: Applied Theory

6. Risk-Adjusted Performance Measures: Some Issues

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Let us conclude our discussion on performance measures with a discussion on the criticism leveled against the use of these measures.

Use of Market Surrogate

All measures other than Sharpe's measure require the identification of a market portfolio. Empirical studies conducted in the US market have also revealed that when commonly used NYSE based surrogates are involved such as the Dow-Jones Industrial Average, the S&P 500 or any index comparable to the NYSE composite, the performance ranking of the common (equity) stock portfolios are quite different. Hence the performance is highly dependent on the selection of market portfolio.

Limitation in Using Market Index as a Benchmark Portfolio

It has been argued that a market index should not be used as a benchmark portfolio because it is nearly impossible for an investor to construct a portfolio whose returns replicate these on the index. This is because of the transaction costs involved in initially forming the portfolio, in restructuring the portfolio when stocks are replaced in the index; and in purchasing more shares of the stocks comprising the index when the cash dividends are received. Hence, the return on

the index overstate the returns of that a passive investor can earn.

Skill or Luck

Obviously, an investor would like to know whether an apparently successful investment manager was skilled or just lucky. Unfortunately a very long time interval is needed to distinguish skill from luck on the part of the investment manager.

Validity of CAPM

The measure of portfolio performance (Jensen's measure and Treynor's measure) are based on the CAPM, which may not be the correct asset pricing model. Put differently, if assets are priced according to some other model, say the APT model, use of the beta based performance measure will be inappropriate. It must be noted that the Sharpe's measure (reward-to-variability ratio) is immune to this criticism because it uses standard deviation as a measure of risk and does not rely on the validity or on the identification of a market portfolio.

7. The following are popular approaches of asset allocations:

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Popular Approach

In the words of a layman, asset allocation can be looked at as a decision on how to divide the income between current spending and investment, and how to distribute the investment among the various possible avenues to attain the targeted goals. The methods in this approach generally try to capture a part of the wisdom that professionals get through years of study and practice into some rules of thumb.

100 Minus Your Age Method

According to this method, the percentage of your total investment that can be invested in equities depends on your age and is based on the premise that you will live to be 100 years old. The method suggests that the proportion of investment to be placed in equities is 100 minus your age. The rest may be placed in bonds and other safe investments.

Your Age	100 Minus Your Age	% Investment in Equities	% Investment in Bonds
30	70	70	30
40	60	60	40
50	50	50	50
60	40	40	60

Though life expectancy is increasing, the probability of a person living beyond 100 is still low. As the age increase, the ability to take risk normally declines. This method essentially addresses this issue.

The person who uses this method reduces his allocation to equities as he/she grows old. This method, while based on the general perceptions about the desirable exposure to equities over the life of a person, suffers from some obvious defects. It does not take into account the life expectancy of a person, the factor of inflation, the wealth to be accumulated or the current financial needs. Over the years, this method results in increase in the current income and decrease in growth, which can be harmful for the financial condition of the person considering inflation and increasingly long life expectancies.

Financial Objectives Method

This method is based more on common sense than anything else. It simply says, plan your financial needs in future and invest enough money so that you will be able to realize them. It does not talk anything about how and where and when to invest. If your goals are short-term, invest in short-term liquid investments and if they are long term go for long-term investments. All that you have to know is what you want to achieve and how much you can save today for that.

Cash Flow Needs Method

This Method, as the name suggests, involves projecting the cash flows of the future and estimating the deficit if any. Investments will then be aimed at filling the deficit. The sources of income that a person may have, for example, may be wages and salary, pension payments, interest and dividend income on investments already made, rental income from properties, sale proceeds of properties, inheritance of property, sale of used vehicle, etc. The outflows expected in future should then be reduced from the inflows. If there is a surplus, then you may go for conservative or safe investments. In case there is a deficit, investments will have to be made aggressive

and the degree of aggressiveness depends on the amount of deficit and the amount now available for investment.

Risk Tolerance Method

This method ignores the financials and focuses on the psychology of the individual. According to this method, a risk-averse person should invest all or most of the money available in low risk investments and a risk-lover may invest in high risk instruments.

100% Common Stocks for Long Run

This strategy involves placing all the long-term investments entirely in equity stocks. This method generally gets into popularity when stock markets are on a high and falls in popularity along with the markets. There is no other basis, scientific or otherwise, for it.

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