This question paper contains 4 printed pages.

4212 *Your Roll No.* .....

MBA (FT) **A**

Paper F–3103— PORTFOLIO MANAGEMENT

Time : 3 hours *Maximum Marks* : 70

(Write your Roll No. on the top immediately on receipt of this question paper.)

Answer any five questions. Answers should be brief and precise.

1. **(A)** Suppose the Utility function of investors is described by $U = \sqrt{w}$ where w represents wealth of the investor.
   i) What is the utility level at wealth levels ₹ 50,000 and ₹ 150,000?
   ii) What is the expected utility from a game resulting in the wealth level of ₹ 50,000 or ₹ 150,000 with 50:50 probabilities?
   iii) What is the certainty equivalent of the risky game?
   iv) Does this utility function display risk aversion?
   v) Does this utility function display more or less risk aversion than the utility function of the type $U = \ln(w)$?

   7

   (B) What is Skewness preference of an investor? How does this preference incorporated in the utility function of the investor? What role Samuelson's 'Fundamental Approximation Theorem of Portfolio Analysis' play in respect to these preferences?

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2. **(A)** Ms. Archana Joshiya has ₹ 9,00,000 invested in a well-diversified portfolio. She inherits the equity shares of Bajaj Auto Ltd. worth ₹ 1,00,000 from her deceased Grandmother. The inheritance changes Ms. Joshiya's overall portfolio and she is to decide whether to keep the Bajaj Auto Ltd. shares. Her financial advisor provided the following information about the expected features of her likely investments:

	Expected returns	**Standard deviation of returns**
Current portfolio	8%	28.5%
Bajaj Auto Ltd.	15%	35.5%
Correlation coefficient	+0.4	

   Based on the above information, answer the following questions:
   i) If Ms. Joshiya keeps the Bajaj Auto Ltd. shares, compute the expected return and standard deviation of her new portfolio which includes the Bajaj Auto Ltd.
   ii) If Ms. Joshiya sells the shares of Bajaj Auto Ltd. and invests the proceeds into risk-free government securities yielding 5.1% p.a., compute the expected return and standard deviation of her new portfolio which includes the government securities.

Turn over

iii) If Ms. Joshiya has a degree of aversion of 4, will she acquire more utility in retaining the Bajaj Auto Ltd. shares or converting these shares into government securities?

iv) If Ms. Joshiya plan to replace all shares of Bajaj Auto Ltd. with the shares of Hero Honda Ltd. with almost similar expected return and standard deviation, is it really justified to go for this replacement?

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(B) "A positive spread between the rates of borrowing and lending ensures that a group of investors will not be bothered about these rates in multi-assets case". Comment on this statement with your justification.

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(C) What is the assumption of Non-Satiation? What does it imply?

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3. **(A)** If simple Capital Asset Pricing Model holds true in a market, which of the following independent situations are possible. Justify.

	Portfolio	Expected return	Standard deviation	Beta
i)	P	20	-	1.4
	Q	25	-	1.2
ii)	P	30	35	-
	Q	40	25	-
iii)	P	16	12	-
	Market	18	24	-
	Risk-free	10	0	0
iv)	P	20	22	-
	Market	18	24	-
	Risk-free	10	0	0
v)	P	16	-	1.5
	Market	18	-	1.0
	Risk-free	10	0	0
vi)	P	16	-	0.9
	Market	18	-	1.0
	Risk-free	10	0	0
vii)	P	16	22	-
	Market	18	24	-
	Risk-free	10	0	0

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(B) Critically examine the role of various assumptions involved in the derivation of security market line as per Capital Asset pricing model.

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4. **(A)** Assume that the following two-Index model describes the returns:

$$R = a + b_1 I_1 + b_2 I_2 + e$$

Assume that the following three well-diversified portfolios are observed:

Portfolio	Expected returns	b_1	b_2
X	12	1	0.5
Y	13.4	3	0.2
Z	12	3	-0.5

i) Find the equation of the plane that must describe equilibrium returns.

ii) If $(R_m - R_f) = 4$, find the values of factor sensitivities that would make these equilibrium returns consistent with Two-factor CAPM.

iii) Describe the arbitrage opportunities that would exist if a portfolio called P with the following properties were observed.

$$\overline{R_P} = 10 \quad b_{P1}=2 \quad b_{P2}=0$$

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(B) Compare and contrast CAPM and APT.

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5. **(A)** Construct an optimum risky portfolio from the following securities using Single – Index model assuming the risk – free return of 5% and the market index variance of $10(\%)^2$ when short sales of securities are allowed:

Security	Expected Return	Beta	σ^2_{ei}
ABB	7	0.8	16
BEL	11	1.0	40
GKL	12	1.0	20
HUL	11	1.5	30
JKS	17	2.0	10
TCS	11	2.0	40

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(B) Differentiate between Multi-Factor model, Multi-Index model and Arbitrage Pricing model.

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6. **(A)** A fund begins with ₹ 20 lac and reports the following results for four periods:

Period	1	2	3	4
Rate of return	5%	12%	16%	3%
Net inflow (in lac) at the end of period	10	50	30	0

Compute the arithmetic, time-weighted and money-weighted average returns. Also suggest the relevance of each of the values so computed.

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(B) Analyse the portfolio return as per Fama's decomposition. What do these decomposed parts imply? How does decomposed net selectivity differ from M^2?

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(C) Explain Market Timing ability of portfolio managers while evaluating the performance of portfolio.

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7. **(A)** A portfolio manager summarises the inputs from the macro and micro forecasters in the following table:

Stocks	Expected returns	Beta	Residual standard deviation (%)
A	20	1.3	58
B	17	0.7	60

Treasury-bill rate is 8% and Passive portfolio is providing 16% return with 23% standard deviation.

i) Calculate the alpha values of each stock.

ii) Construct optimal Active portfolio.

iii) Construct optimal Risky portfolio.

iv) What is the Sharpe's measure for the optimal Risky portfolio and how much of it is contributed by the Active portfolio?

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(B) What is Information (Appraisal) ratio? When should we use this as a measure for portfolio evaluation? How does it differ from –

i) Risk adjusted absolute performance measures

ii) Risk adjusted relative performance measures?

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