

[This question paper contains 4 printed pages]

Your Roll No

7252

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M.Sc./II

OPERATIONAL RESEARCH

Course—XV & XVIII (X)

(Portfolio Management)

(Admissions of 2001 and onwards)

Time 3 Hours

Maximum Marks 75

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

Attempt any Five questions

All questions carry equal marks

- 1 (a) What is an investment decision process ? What factors should an investor consider before making investment decisions ? 5
- (b) Define risk. What are the sources of risk in an investment ? Explain in detail 5
- (c) Explain how a given investor chooses an optimal portfolio ? Will his choice always be a diversified portfolio or could be a single asset ? Explain 5
- 2 (a) Why are investor's utility curves important in utility theory ? 6

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- (b) An investor has Rs 1 million to invest in a portfolio with two risky assets with normally distributed returns. Asset 1 has an expected return of 8% with a volatility of 15% and asset 2 has an expected return of 12% with a volatility of 20%. The correlation between the two asset returns is -0.5 . If the investor has an exponential utility function with an absolute risk tolerance coefficient of Rs. 2,50,000, how much does he invest in each asset. 9
- 3 (a) Explain the risk-return relationship formulated by Markowitz model. How the efficient portfolio is built as per Markowitz model? 7
- (b) Mr X has Rs 1,00,000 to invest in two risky assets. Asset 1 has a return volatility of 20% and asset 2 has a return volatility of 30% and the returns have a correlation of -0.25 . What allocation to each asset will minimize the variance of the portfolio? What is the volatility of the minimum variance portfolio? 8
- 4 Explain the Capital Asset Pricing Model. What are the assumptions and limitations of this model? Also explain how this model can be used for estimating the expected return of a security. 15
- 5 (a) Differentiate between the characteristic line and security market line. 7

(b) Following information is available in respect of a security . 8

β of the security 0.8

Rate of return on market portfolio 15%

Risk-free rate of return 7%

Find the expected rate of return of the security
Also find out the β of the security which has the expected return of 20%

6 (a) What is the Arbitrage Pricing Theory (APT) and what are its similarities and differences relative to the CAPM (Capital Asset Pricing Model) ? 7

(b) Consider the following data for two-risk factors (1 & 2) and two securities L & K

$$\lambda_0 = 0.05 \qquad b_{L1} = 0.80$$

$$\lambda_1 = 0.02 \qquad b_{L2} = 1.40$$

$$\lambda_2 = 0.04 \qquad b_{K1} = 1.60$$

$$b_{K2} = 2.25$$

(i) Compute the expected returns for both securities using APT

(ii) Suppose that security L is currently priced at Rs 22.50 and security K is at Rs 15.00. Further, it is expected that both securities will pay a dividend of Re 0.75 during the coming year. What is the expected price of each security one year from now 8

- 7 (a) Explain the single index market model. Also show how this model can be used to study the effect of diversification on the portfolio's systematic and unsystematic risk. 7
- (b) Consider the following data for two securities

<i>Security</i>	<i>Expected Return</i>	<i>Beta</i>	<i>Firm-specific Standard Deviation</i>
A	13	0.8	30
B	18	1.2	40

The market index has a standard deviation of 22% and risk-free return is 8%

- (i) What is standard deviation of security A & B ?
- (ii) If a portfolio is constructed with proportions

Security A	0.3
Security B	0.45
T-bills	0.25

Compute the expected return, standard deviation, beta and non-systematic standard deviation of the portfolio. 8