

**PRACTICAL QUESTIONS ON CAPITAL ASSET PRICING MODEL AND
ARBITRAGE PRICING THEORY**

1. The following table, gives the rate of return on stock of Apple Computers and on the market portfolio for five years

<i>Year</i>	<i>Return on the stock Apple Computers (%)</i>	<i>Return Market Portfolio (%)</i>
1	-13	-3
2	5	2
3	15	8
4	27	12
5	10	7

- (i) What is the beta of the stock of Apple Computers?
(ii) Establish the characteristic line for the stock of Apple Computers.

2. The rate of return on the stock of Sigma Technologies and on the market portfolio for 6 periods has been as follows:

<i>Period</i>	<i>Return on the stock of Sigma Technologies (%)</i>	<i>Return on the market portfolio (%)</i>
1	16	14
2	12	10
3	-9	6
4	32	18
5	15	12
6	18	15

- (i) What is the beta of the stock of Sigma Technologies.?
(ii) Establish the characteristic line for the stock of Sigma Technologies

3. The rate of return on the stock of Omega Electronics and on the market portfolio for 6 periods has been as follows:

<i>Period</i>	<i>Return on the stock of Omega Electronics (%)</i>	<i>Return on the market portfolio (%)</i>
1	18%	15%
2	10%	12%
3	-5%	5%

4	20%	14%
5	9%	-2%
6	18%	16%

(i) What is the beta of the stock of Omega Electronics?

(ii) Establish the characteristic line for the stock of Omega Electronics.

4. The risk-free return is 8 percent and the return on market portfolio is 16 percent. Stock X's beta is 1.2; its dividends and earnings are expected to grow at the constant rate of 10 percent. If the previous dividend per share of stock X was Rs.3.00, what should be the intrinsic value per share of stock X?
5. The risk-free return is 7 percent and the return on market portfolio is 13 percent. Stock P's beta is 0.8; its dividends and earnings are expected to grow at the constant rate of 5 percent. If the previous dividend per share of stock P was Rs.1.00, what should be the intrinsic value per share of stock P?
6. The risk-free return is 6 percent and the expected return on a market portfolio is 15 percent. If the required return on a stock is 18 percent, what is its beta?
7. The risk-free return is 9 percent and the expected return on a market portfolio is 12 percent. If the required return on a stock is 14 percent, what is its beta?
8. The risk-free return is 5 percent. The required return on a stock whose beta is 1.1 is 18 percent. What is the expected return on the market portfolio?
Therefore return on market portfolio = 16.81 %
9. The risk-free return is 10 percent. The required return on a stock whose beta is 0.50 is 14 percent. What is the expected return on the market portfolio?
10. The required return on the market portfolio is 15 percent. The beta of stock A is 1.5. The required return on the stock is 20 percent. The expected dividend growth on stock A is 6 percent. The price per share of stock A is Rs.86. What is the expected dividend per share of stock A next year?

What will be the combined effect of the following on the price per share of stock?

- (a) The inflation premium increases by 3 percent.
 - (b) The decrease in the degree of risk-aversion reduces the differential between the return on market portfolio and the risk-free return by one-fourth.
 - (c) The expected growth rate of dividend on stock A decrease to 3 percent.
 - (d) The beta of stock A falls to 1.2
11. The required return on the market portfolio is 16 percent. The beta of stock A is 1.6. The required return on the stock is 22 percent. The expected dividend growth on stock A is 12

percent. The price per share of stock A is Rs.260. What is the expected dividend per share of stock A next year?

What will be the combined effect of the following on the price per share of stock?

- (a) The inflation premium increases by 5 percent.
- (b) The decrease in the degree of risk-aversion reduces the differential between the return on market portfolio and the risk-free return by one-half.
- (c) The expected growth rate of dividend on stock A decrease to 10 percent.
- (d) The beta of stock A falls to 1.1

12. The following information is given:

Expected return for the market	=	15%
Standard deviation of the market return	=	25%
Risk-free rate	=	8%
Correlation coefficient between stock A and the market	=	0.8
Correlation coefficient between stock B and the market	=	0.6
Standard deviation for stock A	=	30%
Standard deviation for stock B	=	24%

- (i) What is the beta for stock A?
- (ii) What is the expected return for stock A?

13. The following table gives an analyst's expected return on two stocks for particular market returns.

<u>Market Return</u>	<u>Aggressive Stock</u>	<u>Defensive Stock</u>
5%	- 5%	10%
25%	45%	16%

- (i) What is the ratio of the beta of the aggressive stock to the beta of the defensive stock?
- (ii) If the risk-free rate is 7% and the market return is equally likely to be 5% and 25% what is the market risk premium?
- (iii) What is the alpha of the aggressive stock?

14. The following table gives an analyst's expected return on two stocks for particular market returns.

<u>Market Return</u>	<u>Aggressive Stock</u>	<u>Defensive Stock</u>
8%	2%	10%
20%	32%	16%

- (i) What is the beta of the aggressive stock?

- (ii) If the risk-free rate is 6% and the market return is equally likely to be 8% and 20%, what is the market risk premium?
- (iii) What is the alpha of the aggressive stock?