

IAPM:

Illustration 1

Calculate the expected rate of return from the following information relating to B Ltd.

State of the Economy	Probability of Occurrence	Rate of Return
Boom	0.30	40%
Normal	0.50	30%
Recession	0.20	20%

Illustration 2

An investor would like to find the expected return on the share of Golden Ltd. The following data have been available:

State of the Economy	Probability of Occurrence	Rate of Return (%)
Boom	0.30	30
Normal	0.50	18
Recession	0.20	10

Calculate the expected return from the share.

Illustration 3

Given below are the likely returns in case of shares of VCC Ltd. and LCC Ltd. in the various economic conditions. Both the shares are presently quoted at 100 per share.

Economic Conditions	Probability	Returns of VCC Ltd.	Returns of LCC Ltd.
High Growth	0.3	100	150
Low Growth	0.4	110	130
Stagnation	0.2	120	90
Recession	0.1	140	60

Which of the two companies are risky investments?

Illustration 4

The rate of return of stocks of A and B under different states of economy are presented below along with the probability of the occurrence of each state of the economy.

	Boom	Normal	Recession
Probability of Occurrence	0.3	0.4	0.3
Rate of Return on stock A (%)	20.0	30.0	50.0
Rate of Return on stock B (%)	50.0	30.0	20.0

(a) Calculate the expected rate of return and standard deviation of return for stocks A and for stocks B.

(b) If you could invest in either stocks A or stocks B, but not in both, which stock would you prefer and why?

(c) If the rate of return on stocks A was revised as shown below, would your preference in question (b) above change? Why?

	Boom	Normal	Recession
Rate of Return on stock A (%)	50.0	40.0	30.0

Illustration 5

Shankar has been considering investment in stock X or Y. He has estimated the following distribution of returns of stock X and Stock Y.

Return on stock X	Return on stock Y	Probability
-10	05	10
0	10	25
10	15	40
20	20	20
30	25	05

Illustration 6

The rate of return on Stocks X and Y under different states of the economy are given below:

	Boom	Normal	Recession	
Probability of occurrence	0.35	0.50	0.15	(i) Calculate the expected return and standard deviation of return on both the stocks.
Rate of Return on stock X (%)	20	30	40	
Rate of Return on stock Y (%)	40	30	20	

(ii) If you could invest in either stocks X or stock Y, but not in both, which stock would you prefer?

(iii) What would be your decision if the probability changes to 0.30: 0.40: 0.30?

Illustration 7

Calculate the holding period return in the following example:

	A Ltd. (₹)	B Ltd. (₹)
Price as on 31-3-2017	20	10
Price as on 31-3-2018	15	15
Dividend for the year	1	1

Illustration 8

In January 2011, Mr. Dhimant Kapadia purchased the following 5 scrips:

Co.'s Name	No. of Shares	Purchase Price
H Ltd.	100	250
C Ltd.	100	180
S Ltd.	100	80
F Ltd.	100	240
M Ltd.	100	260

He paid brokerage of 1,500

During the year 2011, Mr. Dhimant Kapadia received the following:

Co's Name	Dividend	Bonus Shares
H Ltd.	300	1:2
C Ltd.	290	
S Ltd.	450	
F Ltd.	500	
M Ltd.	600	

In January 2018, Mr. D sold all his holdings at the following prices:

Co's Name	Market Price
H Ltd.	275
C Ltd.	240
S Ltd.	108
F Ltd.	200
M Ltd.	400

He paid brokerage of 1,865.

Calculate the holding period return.

#### Illustration 9

Dr. Shah purchased 400 shares of Sundar Ltd. @ 61 each on 15<sup>th</sup> Oct 2008. He paid a brokerage of 600. The company paid the following dividends:

June 2009	800
June 2010	1000
June 2011	1,200

He sold his holdings for 34,500 (net) on 15th October, 2011.

(1) What is the holding period return? (2) What is the annualized return? (3) Is Mr. Shah a good investor?

Illustration 10

Mr. Ashok purchased 10 shares of ACC Ltd. four years ago at 50 each. The company paid the following dividends.

	Year 1	Year 2	Year 3	Year 4
Dividend per Share (₹)	2	2	2.5	3
Dividend Amount (₹)	20	20	25	30

The current price of the share is 60. What rate of return has he earned on his investment if he sells the shares now?

Illustration 11

You own a portfolio that is 60% invested in Stock X, 25% in stock Y and balance in Stock Z. The expected returns on these stocks are 12%, 16% and 19% respectively. What is the expected return on the portfolio?

Illustration 12

You have 10000 to invest in a stock portfolio. Your choices are Stock X with an expected return of 18% and Stock Y with an expected return of 11%. If your goal is to create a portfolio with an expected return of 16.5%, how much money will you invest in Stock X and in Stock Y?

Illustration 13

Rahul invest the following sums of money in common stocks having expected return as follows:

Security	Amount Invested (₹)	Expected Return
Moser Baer	6000	14%
Kirloskar Cummins	11000	16%
FDC Ltd.	9000	17%
Novartis India	7000	13%

GTL	5000	20%
Pfizer	13000	15%
Excel Industry	9000	18%

1. What is the expected % return on his portfolio?
2. What would be his expected return if Rahul quadruples his investment in GTL while leaving everything else the same?

#### Illustration 14

The common stocks of Bajaj and TVS have expected returns of 15% and 20% respectively, while the standard deviations are 20% and 40%. The expected correlation coefficient between the two stocks is 0.36. What is the expected value of return and the standard deviation of a portfolio consisting of: (a) 40% Bajaj and 60% TVS? (b) 40% TVS and 60% Bajaj?

#### Illustration 15

Mr. X is interested to build a portfolio of investment comprising of risk-free securities ( $R_f = 8\%$ ) and the market portfolio ( $R_m = 18\%$  and Standard deviation = 6%). The minimum expected rate of return of the investor is 15%. In what proportion should he hold the risk-free securities and the market portfolio? Also calculate the expected risk if correlation between the two stock is 0.24.

#### Illustration 16

(a) Stock A has an expected return of 18% and a standard deviation of 30%. Stock B has expected return of 12% and a standard deviation of 36%. The correlation between the two stocks is 0.25 if you form a portfolio where you put 40% of your money in A and 60% in B, what is the expected return and standard deviation for the portfolio?

(b) How will the expected return and standard deviation change if the correlation between the two stocks is zero?

#### Illustration 17

You have decided to invest 40% of your wealth in McDonalds which has an expected return of 15% and a standard deviation of 15%, and 60% of your wealth in GE which has an expected return of 9% and a standard deviation of 14%.

- a) What is the expected return of your portfolio?
- b) If the correlation between McDonalds and GM is 0.5, what is the standard deviation of your portfolio?
- c) If you wanted an expected return of 13%, what percentage should you invest in McDonalds?

Based on your percentage in part C, what would the standard deviation of this portfolio be?

Illustration 18

Following are the price and other details of three stocks for the year 2011. Calculate the total return as well as the return relative for each of three stocks.

Stock	Beginning Price	Dividend Paid	Ending Price
A	30	3.40	34
B	72	4.70	69
C	140	4.80	146

Illustration 19

During the past five years, the returns of a stock were as follows:

Year	Return
1	0.07
2	0.03
3	-0.09
4	0.06
5	0.10

Compute the following: (a) cumulative wealth index, (b) arithmetic mean, (c) geometric mean, (d) variance, and (e) standard deviation.

Illustration 20

You are thinking of acquiring some shares of ABC Ltd. The rates of return expectations are as follows:

Possible rate of return	Probability
0.05	0.20
0.10	0.40
0.08	0.10

0.11	0.30
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Compute the expected return  $E(R)$  on the investment.

#### Illustration 21

The returns of two assets under four possible states of nature are given below:

State of nature	Probability	Return on asset 1	Return on asset 2
1	0.10	5%	0%
2	0.30	10%	8%
3	0.50	15%	18%
4	0.10	20%	26%

- What is the standard deviation of the return on asset 1 and asset 2?
- What is the covariance between the returns on assets 1 and 2?
- What is the coefficient of correlation between the returns on assets 1 and 2?

#### Illustration 22

A portfolio consists of 3 securities, 1, 2, and 3. The proportions of these securities are  $w_1 = 0.3$ ,  $w_2 = 0.5$ , and  $w_3 = 0.2$ . The standard deviations of returns on these securities (in percentage terms) are:  $\sigma_1 = 6$ ,  $\sigma_2 = 9$ , and  $\sigma_3 = 10$ . The correlation coefficients among security returns are  $\rho_{12} = 0.4$ ,  $\rho_{13} = 0.6$ ,  $\rho_{23} = 0.7$ . What is the standard deviation of portfolio returns?

#### Illustration 23

The following information is available.

	Stock A		Stock B
Expected return	16%	0.60	12%
Standard deviation	15%		8%
Coefficient of correlation			

- What is the covariance between stocks A and B?
- What is the expected return and risk of a portfolio in which A and B have weights of 0.6 and 0.4?



#### Illustration 24

The rate of return on stocks of Ben and Ten under different states of the economy are presented below along with the probability of the occurrence of each state of the economy.

Particulars	Boom	Normal	Recession
Probability of occurrence	0.3	0.5	0.2
Rate of Return on Stock Ben (%)	25	35	45
Rate of Return on Stock Ten (%)	45	35	25

- (i) Calculate the expected rate of return and standard deviation of return on stock Ben and Ten.
- (ii) If you could invest in either stock Ben or stock Ten, but not in both, which stock would you prefer?

#### Illustration 25

Ms. Manasi has invested in Mumbai and Goa Limited in the proportion of 40% and 60%. The returns from these companies are given below:-

Year	Mumbai Limited	Goa Limited
1	20%	24%
2	30%	36%

Standard Deviation of both the companies is 3.

Calculate:

- (i) Expected return of Manasi's portfolio
- (ii) Covariance between Mumbai Limited and Goa Limited.
- (iii) Portfolio Risk for Manasi.

Illustration 26

(A) Explain Capital Market Line with suitable diagram and example.

(B) Solve following:

Particulars	Initial Price	Market Price (at the end of the year)	Beta Risk factor
A	13	19	1.25
B	20	25	1.00
C	24	30	1.33

Risk-free Return may be taken at 10% you are required to calculate.

(i) Expected Rate of Return of Portfolio in each by using CAPM

(ii) Average Returns of Portfolio

Illustration 27

The stock of Box Limited performs relatively well to other stocks during recessionary periods. The stock of Cox Limited, on the other hand, does well during growth periods. Both the stocks are currently selling for 100 per share. You assess the rupee return (dividend plus price) of these stocks for the next year as follows:

	<i>Economic Condition</i>			
	<i>High growth</i>	<i>Low growth</i>	<i>Stagnation</i>	<i>Recession</i>
Probability	0.3	0.4	0.2	0.1
Return on Box's stock	100	110	120	140
Return on Cox's stock	150	130	90	60

Calculate the expected return and standard deviation of investing:

- (a) 1,000 in the equity stock of Box Limited
- (b) 1,000 in the equity stock of Cox Limited
- (c) 500 each in the equity stock of Box Limited and Cox Limited.

Illustration 28

The Returns of 2 Assets, under four possible states of nature, are given below:-

State of Nature	Probability	Returns on Asset 01	Returns on Asset 02
1	0.10	5%	0%
2	0.30	10%	8%
3	0.50	15%	18%
4	0.10	20%	26%

Find out: (i) Standard Deviation for Asset 01 and Asset 02.

(ii) Co-variance between Returns of Asset 01 and 02.

(MU,BMS, Apr. 2011)

Illustration 29

Solve following:

Particulars	Initial Priel	Market Priel (at the end of the year)	Beta Risk facton
A	13	19	1.25
B	20	25	1.00
C	24	30	1.33

Risk-free Return may be taken at 10% you are required to calculate.

- (i) Expected Rate of Return of Portfolio in each by using CAPM.
- (ii) Average Returns of Portfolio.

### Illustration 30

Mr. Anil purchased 2500 shares, of JKL Ltd. @ 20/- each (Face Value 5 per share) and paid brokerage @ 2% on 01-01-2009. The company paid dividend @ 50% each year he sold all the shares at 25/- each on 31-12-2010 and paid brokerage of 1,200/-.

The other investment alternative available to him was SBI Fixed Deposit carrying interest @ 12% p.a., for year on compounded basis.

Was his decision to go for share investment right? Offer your comments with reasoning.

(MU, BMS, Apr. 2011)

### Illustration 31

Mr. Anil purchased 200 Shares of JKL Ltd. @ 200/- each (Face Value 5 per share) and paid brokerage @ 1.50% on 01-01-2009. On 17-07-2010 the company declared Bonus Shares in the ratio of 1:1. He received no dividend on these shares in 2009. But on 24-12-2010 the company paid dividend @ 40% dividend. He sold all the shares at 150/- each on 31-12-2010 and paid brokerage of 1,200/-. What is the yearly rate of return on his investment?

Rate the quality of the investment as a Investment Consultant.

(MU, BMS, Oct. 2011)