A: Return and Risk

Q~1

Jenson & Nicholson, a paint company, has the following dividend per share (DIV) and the market price per share (AMP) for the period 1987-92:

Year	DIV (Rs.)	AMP (Rs.)
1987	1.53	31.25
1988	1.53	20.75
1989	1.53	30.88
1990	2.00	67.00
1991	2.00	100.0
1992	3.00	154.00

Calculate the annual rates of return of Jenson's shares for last five years. How risky is the Share?

Q~2 Calculate the expected return and risk of PNB based on the following data.

Year	ONGC (%)	ITC (%)	Kotak Bank (%)
2002	90.68	-11.65	104.22
2003	127.52	22.87	131.39
2004	39.09	39.45	16.62
2005	29.14	-17.69	-3.54
2006	10.85	-80.98	2.92
2007	-0.76	12.14	177.04
2008	-8.59	5.27	-2.63
2009	-0.71	14.53	-34.19
2010	34.75	9.71	16.18

B: Risk and Return (Probabilities)

Q~3 Calculate expected return and risk when following probabilities are assigned.

Economic Stages	Return (%)	Probability
	R_i	P_i
High Growth	28	0.25
Growth	27	0.25
Static	5	0.25
Recession	-18	0.25

Q~4 The return and probabilities o ACC and HERO are given below. Select the security of your preference on the basis of return and risk.

Probability	ACC (%)	HERO (%)
0.5	1.94	5.1
0.4	2.74	74.92
0.1	3.37	52.59

Q~5 An investor is offered following four stocks. An analyst has assigned the following probabilities to each stock, based upon their likely performance in the coming year along with their returns.

Probabilit y	CIPL A	Probabilit y	GAIL	Probabilit y	HCL	Probabilit y	HDFC
0.2	-45.73	0.15	56.02	0.2	-13.2	0.1	66.82
0.4	-9.32	0.35	-6.76	0.4	-52.44	0.25	-1.78
0.3	34.53	0.45	-12.85	0.3	12.07	0.4	-6.54
0.1	32.05	0.05	49.1	0.1	68.82	0.25	-10.45

(a) Are these stocks attractive investments with the given probabilities? Give Reasons.
(b) Which stock would you prefer to buy and why?

Q~6 Nikhil wants to purchase the stocks of the following two companies. He estimates the return and probabilities of returns by analyzing the past records. Find out the expected return and risk from the given details to support your decision.

Probability	JP Associate Return	Kotak Bank Return
0.3	86.48	2.92
0.15	73.39	177.03
0.15	-70.81	-2.63
0.2	-47.45	-34.19
0.2	-6.23	16.18

C: Portfolio Risk & Return (2 Securities)

Q~7 Novex owns a portfolio of two securities with the following expected returns, standard deviations and weights:

Securities	Expected Return	Standard Deviation	Weight
X	12%	15%	.40
Y	15%	20%	.60

What are the maximum and minimum portfolio standard deviation for varying levels of correlation between two securities?

Q~8 An investor holds two equity shares x and y in equal proportion with the following risk and return characteristics:

$E(R_x) = 24\%$ $E(R_y) = 19\%$

$\sigma_x = 28\%$ $\sigma_y = 23\%$

The returns of these securities have a positive correlation of 0.6. You are required to calculate the portfolio return and risk. Further, suppose that the investor wants to reduce the portfolio risk (S_p) to 15 per cent. How much should the correlative be to bring the portfolio risk to the desired level?

Q~9 You are considering investment in one or both of two securities. X and Y and you are given the following information

Security	**Possible rates of return %**	**Probability of occurrence**
X	30	0.3
	25	0.4
	20	0.3
Y	50	0.2
	30	0.6
	10	0.2

Required

(a) Calculate the expected return for each security separately and for portfolio comprising 60% of X and 40% of Y. assuming no correlation between the rates of from the shares comprising the portfolio.

(b) Calculate the expected risk of each security separately and of the portfolio as defined above. Measure risk by the standard deviation of returns form the expected rate of return.

(c) Outline the objectives of portfolio diversification and explain in general terms why the risk on individual securities may differ from that of a portfolio as a whole

Q~10 Consider the following information relating to two stocks:

Stock	Expected Return (%)	Standard Deviation of Return (%)
P	15	30
Q	10	20

The returns of the two stocks exhibit perfect positive correlation. You are required to determine the return and risk of the following combinations of the two stocks:

(a) 70% of P and 30% of Q.
(b) 50% of P and 50% of Q.
(c) 30% of P and 70% of Q.
(d) 10% of P and 90% of Q.

Q~11 Stocks A and B have the following joint probability distribution of returns for next year

Economic Conditions	Probability	Return A %	Return B %
Boom	0.1	20	14
Recession	0.4	-16	-20
Normal	0.2	14	18
Recovery	0.1	9	12
Slow Growth	0.2	8	10

Required:
(a) Determine the expected covariance of returns and the correlation of returns for the stocks A and B.
(b) Determine the portfolio risk for a portfolio of 50 percent in each stock.
(c) For the portfolio defined in (b) determine the correlation coefficient that will be necessary to reduce the level of portfolio risk by 25 percent.

Note: Risk is defined in terms of standard deviation of returns.

D: Beta / Covariance / Correlation / Systematic and Unsystematic Risk

Q~12 Consider the following information on two stocks. A and B.

Year	Return on A (%)	Return on B (%)
1998	10	12
1999	16	18

You are required to determine:
(a) The expected return on a portfolio containing A and B in the proportions 40% and 60%.
(b) The standard deviation of return from each of the two stocks.
(c) The covariance of returns from the two stocks.
(d) Correlation coefficient between the returns of the two stocks.
(e) The risk of a portfolio containing A and B in the proportions 40% and 60%.

Q~13 After a thorough analysis of both the aggregate stock market and the stock of XYZ Company you develop the following opinion

Economic Condition	Likely Returns		Probability
	Aggregate Market	XYZ	
Good	16%	20%	0.4
Fair	12%	13%	0.4
Poor	3%	-5%	0.2

At present the risk – free rate is equal to 7%. Would an investment in XYZ be wise?

Q~14 The following are the returns of share S and the market (M) for the last six years:-

Return (%)		
Year	**S**	**M**
19X1	18	15
19X2	9	7
19X3	20	16
19X4	-10	-13
19X5	5	4
19X6	12	7

(a) Calculate the covariance and correlation coefficient of returns.
(b) Determine the beta coefficient for S
(c) What is S's total risk? How much is systematic risk?

Q~15 A financial analyst Mr. X has prepared the following probability distribution of returns for two scrips X and Y and the market index:

Economic Conditions	**Probability**	**Expected Returns on**		
		X	Y	Market index
High Growth	0.20	-13%	-4%	-9%
Low Growth	0.15	16%	-2%	8%
Stagnation	0.40	32%	21%	16%
Recession	0.25	12%	33%	20%

(a) Calculate the betas of Scrips X and Y.
(b) A portfolio manager, Mr. Robert approaches you to recommend one of these scrips for inclusion in his portfolio, (which consists of 40 equity stocks) which of these scrips will you recommend? Why?

E: Characteristic Line and Alpha

Q~16 The following are the rate of returns on Xenith and the Market Index for a 5 year period.

Year	Rate of return on Xenith	Rate of return on Index
1	0.44	(0.15)
2	0.47	0.36
3	0.15	0.17
4	0.09	(0.12)
5	(0.10)	0.05

a. Calculate the regression equation for the above returns of Xenith and the Index.
b. Indicate (i) total variance for Xenith and (ii) the proportions that are explained and not explained by the Index.

Q~17 Shown below are the return on Xerox and the Standard & Poor's 500 Stock Index for a five-year period.

Year	**Return on Xerox**	**Return on S&P 500**
1	29	(10)
2	31	24
3	10	11
4	06	(08)
5	(07)	03

(a) Calculate the regression equation for the returns you have plotted (i.e., alpha, beta and residual variance) and draw the line for this equation on your graph.
(b) Indicate (1) total variance for Xerox and (2)the proportions that are explained and not explained by the S&P 500.
(c) Plot the return on Xerox versus the S&P 500 on a graph.
(d) The return on Xerox for year 6 was .177. The S&P return was .14. Would the return on Xerox for year 6 be suggested by your regression equation in b? Why or why not?