

Or

(c) Following information is available in respect of the rate of return on two securities A & B :

Condition	Probability	Rate of return on A	Rate of return on B
Recession	0.30	5%	10%
Normal	0.40	25%	15%
Boom	0.30	40%	20%

(i) Find out the expected returns and risk of security A and B.

(ii) Which security is less risky ? Why ?

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Ans. :

$P_i$	$R_A$	$R_B$	$P_i R_A$	$P_i R_B$	$P_i (R_A - \bar{R}_A)^2$	$P_i (R_B - \bar{R}_B)^2$
0.3	5	10	1.5	3	102.675	7.50
0.4	25	15	10	6	2.250	0
0.3	40	20	12	6	81.675	7.50
			23.50	15	188.60	15.00

(i) Expected Returns and risks are

$$E(R_A) = 23.50\%$$

$$E(R_B) = 15\%$$

$$\sigma_A = \sqrt{188.60} = 13.66\%$$

$$\sigma_B = \sqrt{15} = 3.87\%$$

(ii) Coefficient of Variation of Security A =  $\frac{13.66}{23.50} = 0.58$

$$\text{Security B} = \frac{3.87}{15} = 0.258$$

Hence Security B is less risk as it has lower S.D. as well as C.V. than security A.

**Ans. :** See paras 6.4 and 6.5

(d) Define NAV. Find out NAV per unit from the following information : 7

Size of the scheme	₹ 5,00,000
Face value of shares	₹ 5
Number of outstanding shares	₹ 50,000
Market value of fund's investment	₹ 9,00,000
Bills receivable	₹ 20,000
Liabilities	₹ 10,000

**Ans. :** See para 7.1

$$\text{NAV per unit} = \frac{9,00,000 + 20,000 - 10,000}{50,000} = ₹ 18.20$$

(c) The return on securities X and Y under different market situations are given below:

Condition of the market	Probability of return	Possible returns	
		X	Y
BULL	0.3	18	30
NORMAL	0.4	15	12
BEAR	0.3	12	18

Find the risk and return associated with both the securities. Which security should an investor choose and why? (15)

Ans.:

$P_i$	$R_x$	$R_y$	$P_i R_x$	$P_i R_y$	$P_i (R_x - \bar{R}_x)^2$	$P_i (R_y - \bar{R}_y)^2$
0.3	18	30	5.4	9	2.7	34.99
0.4	15	12	6	4.8	0	20.74
0.3	12	18	3.6	5.4	2.7	0.432
			15	19.2	5.4	56.15

### Expected Return

$$E(R_x) = \sum P_i R_x = 15\%$$

$$E(R_y) = \sum P_i R_y = 19.2\%$$

### Risk

$$\sigma_x = \sum P_i (R_x - \bar{R}_x)^2 = \sqrt{5.4} = 2.32\%$$

$$\sigma_y = \sum P_i (R_y - \bar{R}_y)^2 = \sqrt{56.15} = 7.49\%$$

Since the expected return of the two securities is not equal, we cannot use standard deviation to compare their risk. We would rather use a relative measure of risk, i.e., Coefficient of Variation to draw meaningful comparisons.

### Coefficient of Variation

$$C.V_x = \frac{2.32}{15} = 0.15$$

$$C.V_y = \frac{7.49}{19.2} = 0.39$$

Hence Security X is preferred as it has lower Coefficient of variation than security Y. It has lower risk per unit of return generated.

4. (a) What is a mutual fund? Discuss the factors affecting the choice of mutual fund. (8)

Ans. : See paras 6.1, 7.4

- (b) A mutual fund accumulated Rs. 15,00,000 by issuing 1,00,000 units in the beginning of a financial year. It invested Rs. 11,00,000 in the corporate securities whose present price and the price at which mutual fund invested is given along with the return generated to the mutual fund from these securities.

(in Rupees)

Investment	Value at the beginning	Value at the end	Income
Equity	5,00,000	6,00,000	75,000
Debenture	6,00,000	5,50,000	72,000

The mutual fund incurred an expense of Rs. 50,000 during the year. Find out the NAV of the mutual fund at the end of the year. (7)

Ans. :

### Cash balance at the end of the year

Opening balance (Rs. 15 lakhs - 11 lakhs)	Rs. 4,00,000
Dividend received	Rs. 75,000
Interest income	Rs. 72,000

Total	Rs. 5,47,000
Less: Operating expenses	Rs. 50,000
Closing cash balance	Rs. 4,97,000

**Calculation of NAV**

Closing balance	Rs. 4,97,000
Value of equity shares	Rs. 6,00,000
Value of debenture	Rs. 5,50,000
Total	Rs. 16,47,000
Total No. of units	1,00,000
NAV per unit	Rs. 16.47

Or

Or

(b) Two securities A and B have been shortlisted by an investor. The expected rates of return and probabilities are as follows:

Security A		Security B	
Return (%)	Probability	Return (%)	Probability
20	0.25	80	0.10
10	0.40	40	0.30
0	0.25	10	0.40
-10	0.10	-20	0.20

Find out expected return and risk (standard deviation) for both the securities. Which security should be preferred? (10)

Ans. :

$P_{iA}$	$R_A$	$P_{iB}$	$R_B$	$P_i R_A$	$P_i R_B$	$P_{iA}(R_A - \bar{R}_A)^2$	$P_{iB}(R_B - \bar{R}_B)^2$
0.25	20	0.10	80	5	8	36	360
0.40	10	0.30	40	4	12	1.6	120
0.25	0	0.40	10	0	4	16	40
0.10	-10	0.20	-20	-1	-4	32.4	320
			<b>Total</b>	<b>8</b>	<b>20</b>	<b>86</b>	<b>840</b>

**Expected Return**

$$E(R_A) = \sum P_{iA} R_A = 8\%$$

$$E(R_B) = \sum P_{iB} R_B = 20\%$$

**Risk**

$$\sigma_A = \sqrt{\sum P_{iA} (R_A - \bar{R}_A)^2} = \sqrt{86} = 9.27\%$$

$$\sigma_B = \sqrt{\sum P_{iB} (R_B - \bar{R}_B)^2} = \sqrt{840} = 28.98\%$$

Since the expected return of the two securities is not equal, we cannot use standard deviation to compare their risk. We, would rather use a relative measure of risk, i.e., Coefficient of Variation to draw meaningful comparisons.

**Coefficient of Variation**

$$C.V._A = \frac{9.27}{8} = 1.16$$

$$C.V._B = \frac{28.98}{20} = 1.45$$

Hence Security A is preferred as it has lower Coefficient of variation than security B. It has lower risk per unit of return generated.

(c) Explain the market order and limit order for buying and selling of securities in secondary market. (5)

Ans. : See paras 3.4.1, 3.4.2

3. (a) Explain, how the development of mutual fund industry took place in India? (8)

Ans. : See para 6.2

(b) Following information is available in respect of 'Z' mutual fund:

Particulars	Amount (In Rupees)
Cash and bank balance	5,50,000
Bonds & debentures (Listed)	7,00,000



Particulars	Amount (In Rupees)
Equity shares (Current market value)	12,50,000
Value of Government securities	10,05,000
Accrued expenses	75,000
Accrued income	70,000
No. of units outstanding	2,00,000

Find out the Net Asset Value (NAV) per unit of the 'Z' mutual fund. (7)

$$\text{Ans.: NAV per unit} = \frac{550000 + 700000 + 1250000 + 105000 + 70000 - 75000}{200000} = \text{Rs. } 17.5$$

Or