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Internal Assessment Test -I – December - 2021

Sub:	**INVESTMENT MANAGEMENT**				Sub Code:	**20MBAFM303**	Branch:	**MBA**
Date:	**16-12-2021**	Duration:	90 min's	Max Marks: 50	Sem/Sec:	**A & B**		OBE

	<u>Answer any TWO FULL Questions and case study is compulsory</u>	MARKS	CO	RBT
1 (a)	Explain the different investment avenues available to an investor. Which particular type of securities are popular in recent times? **INVESTMENT ALTERNATIVES** 1. **Financial Derivatives** : Futures and Options. 2. **Equity shares** – Blue chip / growth shares, income shares, cyclical shares, speculative shares 3. **Mutual Funds** : Equity Schemes, Debt Schemes and Balanced Schemes 4. **Debenture & Bonds**: Bonds are issued by the government and debentures are issued by both the government and private business houses. 5. **Real Estate**: Residential house, commercial complex, open plot, flat etc. 6. **Precious Objects** like Gold, Silver, Precious stones and art objects etc. 7. **Insurance:** Life insurance 8. **Bank Deposits**: Savings Bank, Fixed Deposits, Current Account deposits etc. 9. **Money Market Instruments** : The instruments whose maturity period is maximum of one year. These are Treasury Bills, Commercial papers, Certificates of Deposits.	**[10]**	CO 1	L2
(b)	Explain in detail the investment process *Investment management is a complex activity which may be broken down into the following steps:* *a) Specification of Investment Objectives and constraints.* *b) Choice of the asset mix* *c) Formulation of portfolio strategy* *d) Selection of securities* *e) Portfolio execution.* *f) Portfolio revision.* *g) Portfolio evaluation.* *a) **Specification of Investment Objectives and constraints**: The typical objectives sought by any investor is :* *Current income* *Capital appreciation* *Safety of capital* *Constraints from liquidity* *Time horizon* *Tax and any other special circumstances need to be identified.* *b) **Choice of the asset mix**: The most important decision in portfolio management is the asset mix decisions. It is concerned with the proportions of stocks(equity shares, and unit/ Shares of Mutual funds), and bonds(fixed,*	**[10]**	CO 1	L2

	income instrument vehicles in general.). The appropriate stock bond mix depends mainly on the risk tolerance and investment horizon of the investor. *c) **Formulation of portfolio strategy**: Once a certain asset mix is chosen, an appropriate portfolio strategy has to be hammered out. 2 broad choices are available :* *Active portfolio strategy: Earns superior risk adjusted returns by resorting to market timings, or sector rotation, or security selection, or a combination of these.* *Passive portfolio strategy: on the other hand holding a broadly diversified portfolio and maintaining a pre-determined level of risk exposure.* *d) **Selection of securities**: Generally investors, pursue an active stance with respect to security selection. For selecting stock selection, investors commonly go with fundamental and technical analysis. The factors to be considered for selecting(fixed income instruments) like bonds are yield to maturity(YTM), credit rating, term to maturity, tax shelter and liquidity.* *e) **Portfolio execution**: This is the phase of portfolio management which is concerned with implementing in portfolio plan by buying / selling specified securities in given amounts. This is an important step that has a bearing on investment results.* *f) **Portfolio revision:** The value of a portfolio as well as its comparison relative proportions of stock and bond components may change as their price fluctuates. Fluctuations in stock prices is often the dominant factor underlying the change. The investor will shift from stock to bond and vice versa, it may call for sector rotation as well as security switches.* *g) **Performance evaluation**: The performance of portfolio should be evaluated periodically. The key dimensions of portfolio performance evaluations are risk and return and the key issue is whether the portfolio return is commensurate with its risk exposure. Such a review may provide useful feedback to improve the quality of portfolio management process on a continuous basis.*			
2 (a)	What is systematic risk? Systematic risk refers to the risk inherent to the entire market or market segment. Systematic risk, also known as “undiversifiable risk,” “volatility” or “market risk,” affects the overall market, not just a particular stock or	**[03]**	CO 2	L1

	industry.			
(b)	The historical rates of return of two securities over the past 10 years are given. Calculate the covariance and correlation of the 2 securities.	**[07]**	CO 2	L3

When probability is not given calculation of covariance

12 The historical rates of return of two securities over the past 10 years are given. Calculate the covariance and correlation of the 2 securities

Year	1	2	3	4	5	6	7	8	9	10
Security 1	12	8	7	14	16	15	18	20	16	22
Security 2	20	22	24	18	15	20	24	25	22	20

(14MBAFM303, June-Ju

Solution Calculation of Covariance & correlation :

X_1	X_2	$(X_1-\bar{X}_1)$	$(X_1-\bar{X}_1)^2$	$(X_2-\bar{X}_2)$	$(X_2-\bar{X}_2)^2$	$(X_1-\bar{X}_1)($
12	20	−2.8	7.84	−1	1	2.8
8	22	−6.8	46.24	1	1	−6.8
7	24	−7.8	60.84	3	9	−23.4
14	18	−0.8	0.64	−3	9	2.4
16	15	1.2	1.44	−6	36	−7.2
15	20	0.2	0.04	−1	1	−0.2
18	24	3.2	10.24	3	9	9.6
20	25	5.2	27.04	4	16	20.8
16	22	1.2	1.44	1	1	1.2
22	20	7.2	51.84	−1	1	−7.2
148	210		207.6		84	−8

$\bar{X}_1 = \frac{\Sigma X_1}{N} = \frac{148}{10} = 14.8$

$\bar{X}_2 = \frac{\Sigma X_2}{N} = \frac{210}{10} = 21$

$\sigma_{x_1} = \sqrt{\frac{\Sigma(X_1-\bar{X}_1)^2}{N-1}} = \sqrt{\frac{207.6}{10-1}}$

$\boxed{\sigma_{x_1} = 4.80}$

$\sigma_{x_2} = \sqrt{\Sigma(X_2-\bar{X}_2)^2} = \sqrt{84}$

$Cov_{x_1x_2} = \frac{\Sigma(X_1-\bar{X}_1)(X_2-\bar{X}_2)}{N-1}$

$= \frac{-8}{9}$ $\boxed{Cov_{x_1x_2} = -0.88}$

Corelation $(\gamma_{x_1x_2}) = \frac{Cov_{x_1x_2}}{\sigma_{x_1}\sigma_{x_2}}$

$= \frac{-0.88}{(4.80)(3.05)}$

(c)	see table below; What is the beta value? What is the alpha value?	**[10]**	CO 2	L3

Year	Return on Wipro stock (Y)	Return on BSE (X)
2000	0.20	0.10
2001	0.30	0.20
2002	0.50	0.30
2003	0.4	0.40
2004	0.60	0.50

What is the beta value?

What is the alpha value?

What is the co-efficient of correlation?

What is co-efficient of determination

Solution

Calculation of Beta :

Y^2	Year	Stock (Y)	Market (X)	X^2	XY
0.04	2000	0.20	0.10	0.01	0.02
0.09	2001	0.30	0.20	0.04	0.06
0.25	2002	0.50	0.30	0.09	0.15
0.16	2003	0.40	0.40	0.16	0.16
0.36	2004	0.60	0.50	0.25	0.3
Σ0.9		$\Sigma Y = 2$	$\Sigma X = 1.5$	$\Sigma X^2 = 0.55$	$\Sigma XY = 0.69$

$$\beta = \frac{n\Sigma XY - \Sigma X \Sigma Y}{n\Sigma X^2 - (\Sigma X)^2}$$

$$= \frac{5(0.69) - (1.5)(2)}{5(0.55) - (1.5)^2}$$

$$= \frac{3.45 - 3}{2.75 - 2.25}$$

$$\beta = \frac{0.45}{0.5}$$

$$\boxed{\beta = 0.9}$$

Calculation of Alpha :

$$\alpha = \bar{Y} - \beta\bar{X}$$

$$\bar{Y} = \frac{\Sigma Y}{N} = \frac{2}{5} = 0.4$$

$$\bar{X} = \frac{\Sigma X}{N} = \frac{1.5}{5} = 0.3$$

$$\alpha = 0.4 - (0.9)0.3$$

$$= 0.4 - 0.27$$

$$\boxed{\alpha = 0.13}$$

3 (a) The estimates of the standard deviation and correlation coefficients for the stocks are given below:

Stock	**Standard deviation**	**Correlation with stock**		
		A	**B**	**C**
A	32	1.00	-0.80	0.40
B	26	-0.80	1.00	0.65
C	18	0.40	0.65	1.00

If a portfolio is constructed with 15% of stock A, 50% of stock B, 35% of stock C. what is the portfolio standard deviation?

[05] CO 2 L3

standard deviation?

(14MBAFM303, June-July 2018/10MBAFM322, Dec 201

Solution: Computation of Portfolio Risk :

Given:

$W_A = 15\%$ $\sigma_A = 32$ $r_{AB} = -0.8$

$W_B = 50\%$ $\sigma_B = 26$ $r_{BC} = 0.65$

$W_C = 35\%$ $\sigma_C = 18$ $r_{AC} = 0.4$

Stocks	σ	Correlation with stock		
		A	B	C
A	32	1	-0.8	0.4
B	26	-0.8	1	0.65
C	18	0.4	0.65	1

Portfolio Risk $(\sigma_P) = \sqrt{W_A^2\sigma_A^2 + W_B^2\sigma_B^2 + W_C^2\sigma_C^2 + 2W_AW_B r_{AB}\sigma_A\sigma_B + 2W_BW_C r_{BC}\sigma_B\sigma_C + 2W_AW_C r_{AC}\sigma_A\sigma_C}$

$= \sqrt{(0.15)^2(32)^2 + (0.5)^2(26)^2 + (0.35)^2(18)^2 + 2(0.15)(0.5)(-0.8)(32)(26) + 2(0.5)(0.35)(0.65)(26)(18) + 2(0.15)(0.35)(0.4)(32)(18)}$

$= \sqrt{(0.0225)(1024) + (0.25)(676) + (0.1225)(324) - 99.84 + 106.47 + 24.192}$

$= \sqrt{23.04 + 169 + 39.69 - 99.84 + 106.47 + 24.1}$

$= \sqrt{262.552}$

(b)	Calculate the standard deviation and expected return on Taj food stock and oriental shipping stock.	**[05]**	CO 2	L 3

7. Calculate the standard deviation and expected return on Taj food stock and oriental shipping stock

State of economy	Taj food stock		Oriental shipping stock.	
	Pi	Ri	Pi	Ri
Boom	0.30	16	0.30	40
Normal	0.50	11	0.50	10
Recession	0.20	6	0.20	-20

(16MBAFM303. Dec.2018-Jan.2019)

Solution:

Taj food stock:

11.5

P_i	R_i	$P_i \times R_i$	$(R_i - Er)$	$(R_i - Er)^2$	$P_i(R_i - Er)^2$
0.30	16	4.8	4.5	20.25	6.075
0.50	11	5.5	-0.5	0.25	0.125
0.20	6	1.2	-5.5	30.25	6.05
		11.5			12.25

Expected return $\boxed{Er_T = 11.5}$

Risk/SD $(\sigma) = \sqrt{12.25}$ $\boxed{\sigma_T = 3.5}$

Oriental shipping stock:

13

P_i	R_i	$R_i \times P_i$	$(R_i - Er)$	$(R_i - Er)^2$	$P_i(R_i - Er)^2$
0.30	40	12	27	729	218.7
0.50	10	5	-3	9	4.5
0.20	-20	-4	-33	1089	217.8
		13			441

Expected return $\boxed{Er_O = 13}$

Risk/SD $(\sigma) = \sqrt{441}$ $\boxed{\sigma_O = 21}$

(c) **ST** and **BT** company's shares are presently sold at 60 and 100 respectively. Annual dividends over the next year are expected to 1.5 and 2.5 respectively. **ST** projected earnings per share is 2.5 and **BT** is 4 dividends are expected to grow at 10% per annum in the future and **BT** by 9%. Financial analysts have estimated the likely prices for the year ahead on two stocks to be 66, 72, 75 for **ST** and 114, 126,132 for **BT**.

- You are required to examine the return of each company stock. Choose one stock to be purchased for a holding period of one year.
- If the investors required rate of return is 12% and he wants to hold the stock for a longer period, which stock would you suggest?

[10] CO 2 L 4

35. ST and BT company's shares are presently sold at 60 and 100 respectively. Annual dividends over the next year are expected to 1.5 and 2.5 respectively. ST projected earnings per share is 2.5 and BT is 4. dividends are expected to grow at 10% per annum in the future and BT by 9%. Financial analysts have estimated the likely prices for the year ahead on two stocks to be 66, 72, 75 for ST and 114, 126, 132 for BT.

- You are required to examine the return of each company stock. Choose one stock to be purchased for a holding period of one year.
- If the investor's required rate of return is 12% and he wants to hold the stock for a longer period, which stock would you suggest?

Solution:

Given:

	ST	BT
Currently sold (P_0)	60	100
Dividend (D)	1.5	2.5
EPS	2.5	4
Growth	10%	9%
Estimated prices (P_1)	66, 72, 75	114, 126, 132
r	12%	

$\% \to 0.33, 0.33, 0.34 = 1$ } 1/3

i) Calculation of Expected Prices of ST & BT:

$(P_1 \times W_1) + (P_2 \times W_2) + (P_3 \times W_3)$

Expected Price of ST = $(66 \times 0.33) + (72 \times 0.33) + (75 \times 0.34)$

$\boxed{P_{1ST} = 71}$ $= 71.04$ (or) $\frac{213}{3} = 71$

Expected Price of BT = $(114 \times 0.33) + (126 \times 0.33) + (132 \times 0.34)$

$37.62 + 41.58 + 44.88$

$= 124.08$ (or) $372/3 = 124$

$\boxed{P_{1BT} = 124}$

INVESTMENT MANAGEMENT

Calculation of Returns of ST & BT [Holding Period]

$R_{ST} = \frac{D_1 + P_1 - P_0}{P_0} \times 100 = \frac{1.5 + 71 - 60}{60} \times 100$

$\boxed{R_{ST} = 20.83\%}$

$R_{BT} = \frac{D + P_1 - P_0}{P_0} \times 100 = \frac{2.5 + 124 - 100}{100} \times 100$

$\boxed{R_{BT} = 26.5\%}$

ii) $r = 12\%$, $g = 10\%$, $D_1 = 1.5$

$P_0 = \frac{D_1}{r - g}$

$P_{0ST} = \frac{1.5}{(0.12 - 0.10)}$ $\boxed{P_{0ST} = ₹75}$

$r = 12\%$, $g = 9\%$, $D_1 = 2.5$

$P_{0BT} = \frac{2.5}{(0.12 - 0.09)}$

$\boxed{P_{0BT} = ₹83.33}$

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4 (a)	**Case study Compulsory**	**[10]**	CO 2	L 4

The stocks of Alpha ltd, performs relatively well compared to other stocks during recessionary periods. The stocks of Beta ltd, on the other hand does well during growth periods. Both the stocks are currently selling for 50/share. The financial analyst's assessment of the rupee return (dividend plus price) of these stocks for the next year are as follows

Economic condition				
	High growth	**Low growth**	**Stagnation**	**Recession**
Probability	0.30	0.30	0.20	0.20
Return (Alpha)	55	50	60	70
Return (Beta)	75	65	50	40

Based on the above data calculate the expected return and standard deviation of investing

- Rs 1000 in equity stock of Alpha ltd
- Rs 1000 in equity stock of Beta ltd
- Rs 500 each in the equity stock of Alpha and Beta ltd.
- Rs 700 in the equity stock of Alpha and 300 in Beta ltd.

33. The stocks of Alpha ltd. performs relatively well compared to other stocks during recessionary periods. The stocks of Beta ltd. on the other hand does well during growth periods. Both the stocks are currently selling for [illegible]. The financial analysts assessment of the rupee return (dividend plus price) of these stocks for the next year are as follows:

	Economic condition			
	High growth	Low growth	Stagnation	Recession
Probability	[illegible]	[illegible]	[illegible]	[illegible]
Return (Alpha)	[illegible]	[illegible]	[illegible]	[illegible]
Return (Beta)	[illegible]	[illegible]	[illegible]	[illegible]

Based on the above data calculate the expected return and standard deviation of investing:

- Rs 1000 in equity stock of Alpha ltd
- Rs 1000 in equity stock of Beta ltd
- Rs 500 each in the equity stock of Alpha and Beta ltd
- Rs 700 in the equity stock of Alpha and 300 in Beta ltd

[illegible], June-July 2013 / [illegible], June-July 2016

Solution: i) ₹ 1000 in equity stock of Alpha ltd.:

Situation	P_i	R_i	$R_i \times P_i$	$(R_i - Er_A)$	$(R_i - Er_A)^2$	$P_i(R_i - Er_A)^2$
High growth	0.3	55×20=1100	330	-50	2500	750
Low "	0.3	50×20=1000	300	-150	22,500	6,750
Stagnation	0.2	60×20=1200	240	50	2,500	500
Recession	0.2	70×20=1400	280	250	62,500	12,500
			1150			20500

$\text{No. of shares} = \frac{\text{Amt invested}}{\text{Price per share}} = \frac{1000}{50} = 20$

$\boxed{Er_A = 1150}$

$\sigma_A = \sqrt{20500}$ $\boxed{\sigma_A = 143.178}$

ii) ₹ 1000 in equity stock of Beta ltd.:

Situation	P_i	R_i	$R_i \times P_i$	$(R_i - Er_B)$	$(R_i - Er_B)^2$	$P_i(R_i - Er_B)^2$
High growth	0.3	75×20=1500	450	300	90,000	27,000
Low "	0.3	65×20=1300	390	100	10,000	3,000
Stagnation	0.2	50×20=1000	200	-200	40,000	8,000
Recession	0.2	40×20=800	160	-400	1,60,000	32,000
			1200			[illegible]

iii) ₹500 each in equity stock of Alpha & Beta ltd.:

P_i	R_i × No. of shares	$R_i \times P_i$	$(R_i - Er_{AB})$	$(R_i - Er_{AB})^2$	$P_i(R_i - Er_{AB})^2$
0.3	(55×10)+(75×10)=1300	390	125	15625	687.5
0.3	(50×10)+(65×10)=1150	345	-25	625	187.5
0.2	(60×10)+(50×10)=1100	220	-75	5,625	1125
0.2	(70×10)+(40×10)=1100	220	-75	5625	1125
		1175			7125

$\boxed{Er_{AB} = 1175}$

No. of shares = 500/50 = 10 shares

$\sigma_{AB} = \sqrt{7125}$ $\boxed{\sigma_{AB} = 84.40}$

iv) ₹ 700 in equity stock of Alpha & 300 in Beta ltd.:

P_i	R_i	$R_i \times P_i$	$(R_i - Er)$	$(R_i - Er)^2$	$P_i(R_i - Er)^2$
0.3	(55×14)+(75×6)=1220	366	55	3025	907.5
0.3	(50×14)+(65×6)=1090	327	-75	5625	1687.5
0.2	(60×14)+(50×6)=1140	228	-25	625	125
0.2	(70×14)+(40×6)=1220	244	55	3025	605
		1165			3325

Alpha (No. of shares) = 700/50 = 14 shares

Beta (No. of shares) = $\frac{300}{50}$ = 6 shares.

$\boxed{Er = 1165}$

$\sigma_{AB} = \sqrt{3325}$ $\boxed{\sigma_{AB} = 57.66}$