MUTUAL FUNDS CLASS 4 HOME WORK SUPPORT COVERAGE

Question			Answer			Lecture Time
Q. No	Page no.	Book	Q. No	Page no.	Book	
19	55	HW Q BOOK	19	153	HW ANS BOOK	00:00:31 - 00:02:56
20	55	HW Q BOOK	20	154	HW ANS BOOK	00:02:57 - 00:05:16
EXTRA Q1	159	HW ANS BOOK	EXTRA Q1	159	HW ANS BOOK	00:05:17 - 00:06:20
EXTRA Q2	160	HW ANS BOOK	EXTRA Q2	161	HW ANS BOOK	00:06:21 - 00:08:44
EXTRA Q3	161	HW ANS BOOK	EXTRA Q3	162	HW ANS BOOK	00:08:45 - 00:11:24
34	90	CW Q BOOK	34	164	CW ANS BOOK	00:11:25 - 00:15:28

PART IV: PERFORMANCE EVALUATION AND OTHER TOPICS

Topic 14 PERFORMANCE APPRAISAL

Question 19: SSEI HW Book Page No. 55

The following are the details of three mutual funds of MFL:

	Growth Fund	Balanced Fund	Regular Fund	Market
Average Return (%)	7	6	5	9
Variance	92.16	54.76	40.96	57.76
Coefficient of Determination	0.3025	0.6561	0.9604	

The yield on 182 days Treasury Bill is 9 per cent per annum.

You are required to:

i. Rank the funds as per Sharpe's measure.

ii. Rank the funds as per Treynor's measure.

iii. Compare the performance with the market.

(Source: ICAI)

ANSWER:

	Growth Fund	Balanced Fund	Regular Fund	Market
Average Return (%)	7	6	5	9
Variance	92.16	54.76	40.96	57.76
Std. Deviation	9.60	7.40	6.40	7.60
Coefficient of Determination	0.3025	0.6561	0.9604	
Coefficient of Correlation	0.55	0.81	0.98	
Beta (β)	$\frac{9.60}{7.60} \times 0.55$ = 0.695	$\frac{7.40}{7.60} \times 0.81$ = 0.789	$\frac{6.40}{7.60} \times 0.98$ = 0.825	

(i) Ranking of Funds as per Sharpe Ratio

$$\text{Sharpe Ratio} = \frac{\text{Expected Return - Risk Free Rate of Return}}{\text{Standard Deviation}}$$

	Growth Fund	Balanced Fund	Regular Fund
Sharpe Ratio	$\frac{7-9}{9.60} = -0.208$	$\frac{6-9}{7.40} = -0.405$	$\frac{5-9}{6.40} = -0.625$
Ranking	1	2	3

(ii) Ranking of Funds as per Treynor Ratio

$$\text{Treynor Ratio} = \frac{\text{Expected Return - Risk Free Rate of Return}}{\text{Beta}}$$

	Growth Fund	Balanced Fund	Regular Fund
Treynor Ratio	$\frac{7-9}{0.695} = -2.878$	$\frac{6-9}{0.789} = -3.802$	$\frac{5-9}{0.825} = -4.84$
Ranking	1	2	3

(iii) Comparison of performance with the Market

Sharpe Ratio	$\frac{9-9}{7.60} = 0$
Treynor Ratio	$\frac{9-9}{1} = 0$

Thus, the performance of funds is very poor since all values are negative as compared to market performance.

PART IV: PERFORMANCE EVALUATION AND OTHER TOPICS

Topic 14 PERFORMANCE APPRAISAL

Question 20: SSEI HW Book Page No. 55

There are two Mutual Funds viz. D Mutual Fund Ltd. and K Mutual Fund Ltd. Each having close ended equity schemes.

NAV as on 31-12-2014 of equity schemes of D Mutual Fund Ltd. is ₹ 70.71 (consisting 99% equity and remaining cash balance) and that of K Mutual Fund Ltd. is 62.50 (consisting 96% equity and balance in cash).

Following is the other information:

Particular	Equity Schemes	
	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Sharpe Ratio	2	3.3
Treynor Ratio	15	15
Standard deviation	11.25	5

There is no change in portfolios during the next month and annual average cost is ₹ 3 per unit for the schemes of both the Mutual Funds.

If Share Market goes down by 5% within a month, calculate expected NAV after a month for the schemes of both the Mutual Funds.

For calculation, consider 12 months in a year and ignore number of days for particular month.

(*Source: ICAI*)

ANSWER:

Working Notes:

(i) Decomposition of Funds in Equity and Cash Components

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
NAV on 31.12.14	₹ 70.71	₹ 62.50
% of Equity	99%	96%
Equity element in NAV	₹ 70	₹ 60
Cash element in NAV	₹ 0.71	₹ 2.50

(ii) Calculation of Beta

(1) D Mutual Fund Ltd.

$$\text{Sharpe Ratio} = 2 = \frac{E(R) - R_f}{\sigma_D} = \frac{E(R) - R_f}{11.25}$$

$$E(R) - R_f = 22.50$$

$$\text{Treynor Ratio} = 15 = \frac{E(R) - R_f}{\beta_D} = \frac{22.50}{\beta_D}$$

$\beta_D = 22.50/15 = 1.50$

(2) K Mutual Fund Ltd.

$$\text{Sharpe Ratio} = 3.3 = \frac{E(R) - R_f}{\sigma_K} = \frac{E(R) - R_f}{5}$$

$E(R) - R_f = 16.50$

$$\text{Treynor Ratio} = 15 = \frac{E(R) - R_f}{\beta_K} = \frac{16.50}{\beta_K}$$

$\beta_K = 16.50/15 = 1.10$

(iii) Decrease in the Value of Equity

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Market goes down by	5.00%	5.00%
Beta	1.50	1.10
Equity component goes down	7.50%	5.50%

(iv) Balance of Cash after 1 month

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Cash in Hand on 31.12.14	₹ 0.71	₹ 2.50
Less: Exp. Per month	₹ 0.25	₹ 0.25
Balance after 1 month	₹ 0.46	₹ 2.25

NAV after 1 month

	D Mutual Fund Ltd.	K Mutual Fund Ltd.
Value of Equity after 1 month		
70 x (1 - 0.075)	₹ 64.75	-
60 x (1 - 0.055)	-	₹ 56.70
Cash Balance	0.46	2.25
	65.21	58.95

PART IV: PERFORMANCE EVALUATION AND OTHER TOPICS

EXTRA QUESTION

Topic 14 PERFORMANCE APPRAISAL

Question 1: HOME WORK ANS BOOK PAGE 159

There are two Mutual Funds viz., A and B each having close ended equity schemes.

Net Asset Value (NAV) per unit as on 31st December 2020 of equity schemes of A is ₹ 80.10 (consisting 98% equity and remaining cash balance) and that of B is ₹ 64.60 (consisting 97% equity and balance in cash).

Other information is as follows:

Particulars of Equity Schemes	A	B
Sharpe Ratio	2.50	3.20
Treynor Ratio	15	15
Standard Deviation	8.50	5.00

There is no change in portfolios during the next month and annual average cost is ₹ 3.00 per unit for the schemes of both the Mutual Funds.

Assume 30 days in a month, and compute up to two decimal points only.

You are required to calculate the expected NAV per unit after a month for the schemes of both the Mutual Funds, if the share market goes down by 4% within a month.

(Source: ICAI)

ANSWER:

Working Notes:

(i) Decomposition of Funds in Equity and Cash Components

	A Mutual Fund	B Mutual Fund
NAV on 31.12.21	₹ 80.10	₹ 64.60
% of Equity	98%	97%
Equity element in NAV	₹ 78.50	₹ 62.66
Cash element in NAV	₹ 1.60	₹ 1.94

(ii) Calculation of Beta

(a) A Mutual Fund

$$\text{Sharpe Ratio} = 2.50 = \frac{E(R) - R_f}{\sigma_A} = \frac{E(R) - R_f}{8.50}$$

$E(R) - R_f = 21.25$

$$\text{Treynor Ratio} = 15 = \frac{E(R) - R_f}{\beta_A} = \frac{21.25}{\beta_A}$$

$B_{AJ} = 21.25/15 = 1.42$

(b) B Mutual Fund

$$\text{Sharpe Ratio} = 3.20 = \frac{E(R) - R_f}{\sigma_B} = \frac{E(R) - R_f}{5}$$

$E(R) - R_f = 16$

$$\text{Treynor Ratio} = 15 = \frac{E(R) - R_f}{\beta_B} = \frac{16}{\beta_B}$$

$\beta_K = 16/15 = 1.07$

(iii) Increase in the Value of Equity

	A Mutual Fund	B Mutual Fund
Market down by	4.00%	4.00%
Beta	1.42	1.07
Equity component goes down	5.68%	4.28%

(iv) Balance of Cash after 1 month

	A Mutual Fund	B Mutual Fund
Cash in Hand on 31.12.20	₹ 1.60	₹ 1.94
Less: Exp. Per month (₹ 3/12)	₹ 0.25	₹ 0.25
Balance after 1 month	₹ 1.35	₹ 1.69

NAV after 1 month

	A Mutual Fund	B Mutual Fund
Value of Equity after 1 month		
78.50 x (1 - 0.0568)	₹ 74.04	-
62.66 x (1 - 0.0428)	-	₹ 59.98
Cash Balance	₹ 1.35	₹ 1.69
	₹ 75.39	₹ 61.67

PART IV: PERFORMANCE EVALUATION AND OTHER TOPICS

EXTRA QUESTION

Topic 14 PERFORMANCE APPRAISAL

Question 2: HOME WORK ANS BOOK PAGE 160

During the year 2017 an investor invested in a mutual fund. The capital gain and dividend for the year was ₹ 3.00 per unit, which were re-invested at the year end NAV of ₹ 23.75. The investor had total units of 26,750 as at the end of the year. The NAV had appreciated by 18.75% during the year and there was an entry load of ₹ 0.05 at the time when the investment was made. The investor lost his records and wants to find out the amount of investment made and the entry load in the mutual fund.

(Source: ICAI)

ANSWER:

NAV in the Beginning of year = (₹23.75/ 118.75) ×100 = ₹ 20

No. of Units after Bonus issue = 26,750

Let x be the No. of Units acquired then

$$26{,}750 = x + \frac{x \times 3}{23.75}$$

x = 23,750 units

Investment Amount = 23,750 units (₹ 20 + ₹ 0.05) = ₹ 4,76,187.50

Entry load = ₹ 1,187.50 i.e. (23750 × ₹ 0.05)

PART IV: PERFORMANCE EVALUATION AND OTHER TOPICS

EXTRA QUESTION

Topic 15 DIVIDEND EQUALIZATION

Question 1: HOME WORK ANS BOOK PAGE 161

On 1st April, an open-ended scheme of mutual fund had 300 lakh units outstanding with Net Assets Value (NAV) of ₹ 18.75. At the end of April, it issued 6 lakh units at opening NAV plus 2% load, adjusted for dividend equalization. At the end of May, 3 Lakh units were repurchased at opening NAV less 2% exit load adjusted for dividend equalization. At the end of June, 70% of its available income was distributed.

In respect of April-June quarter, the following additional information are available:

	₹
Portfolio value appreciation	425.47
Income of April	22.950
Income for May	34.425
Income for June	45.450

You are required to calculate

i. Income available for distribution;
ii. Issue price at the end of April;
iii. repurchase price at the end of May; and
iv. net asset value (NAV) as on 30th June.

(Source: ICAI)

ANSWER:

Calculation of Income available for Distribution

	Units (Lakh)	*Per Unit (₹)*	*Total (₹ In lakh)*
Income from April	300	0.0765	22.9500
Add: Dividend equalization collected on issue	6	0.0765	0.4590
	306	0.0765	23.4090
Add: Income from May		0.1125	34.4250
	306	0.1890	57.8340
Less: Dividend equalization paid on repurchase	3	0.1890	(0.5670)
	303	0.1890	57.2670
Add: Income from June		0.1500	45.4500
	303	0.3390	102.7170
Less: Dividend Paid		0.2373	(71.9019)
	303	0.1017	30.8151

Calculation of Issue Price at the end of April

	₹
Opening NAV	18.750
Add: Entry Load 2% of ₹ 18.750	(0.375)
	19.125
Add: Dividend Equalization paid on Issue Price	0.0765
	19.2015

Calculation of Repurchase Price at the end of May

	₹
Opening NAV	18.750
Less: Exit Load 2% of ₹ 18.750	(0.375)
	18.375
Add: Dividend Equalization paid on Issue Price	0.1890
	18.564

Closing NAV

		₹ (Lakh)
Opening Net Asset Value (₹ 18.75 × 300)		5625.0000
Portfolio Value Appreciation		425.4700
Issue of Fresh Units (6 × 19.2015)		115.2090
Income Received (22.950 + 34.425 + 45.450)		102.8250
		6268.504
Less: Units repurchased (3 × 18.564)	-55.692	
Income Distributed	-71.9019	(-127.5939)
Closing Net Asset Value		6140.9101
Closing Units (300 + 6 – 3) lakh		303 lakh
∴ Closing NAV as on 30th June		₹ 20.2670

Question 34: SSEI CW Book Page No. 90

The following are the data on five mutual funds:

Fund	Return	Standard Deviation	Beta
A	15	7	1.25
B	18	10	0.75
C	14	5	1.40
D	12	6	0.98
E	16	9	1.50

You are required to compute Reward to Volatility Ratio and rank these portfolio using:

- Sharpe method and
- Treynor's method

Assuming the risk free rate is 6%.

(*Source: ICAI*)

ANSWER:

Sharpe Ratio $S = (R_p - R_f)/\sigma_p$

Treynor Ratio $T = (R_p - R_f)/\beta_p$

Where,

R_p = Return on Fund
R_f = Risk-free rate
σ_p = Standard deviation of Fund
β_p = Beta of Fund Reward to Variability (Sharpe Ratio)

Reward to Variability (Sharpe Ratio)

MutualFund	R_p	R_f	$R_p - R_f$	σ_p	Reward toVariability	Ranking
A	15	6	9	7	1.285	2
B	18	6	12	10	1.20	3
C	14	6	8	5	1.60	1
D	12	6	6	6	1.00	5
E	16	6	10	9	1.11	4

Reward to Volatility (Treynor Ratio)

MutualFund	R_p	R_f	$R_p - R_f$	β_p	Reward toVolatility	Ranking
A	15	6	9	1.25	7.2	2
B	18	6	12	0.75	16	1
C	14	6	8	1.40	5.71	5
D	12	6	6	0.98	6.12	4
E	16	6	10	1.50	6.67	3