MUTUAL FUNDS

Meaning

Trust pools together the **resources of investors** to initiate investments into capital market, hence making the **investor part owner** of the assets of the mutual fund

A. Calculation of Net Assets of Mutual Funds:

Particulars	₹
Closing Market Value of Investment in securities (Number of securities x closing MP)	xxx
(+) Receivables	xxx
(+) Other Accrued Income	xxx
(+) Cash Closing Balance	xxx
(-) Accrued Expense	(xxx)
(-) Other Liability (Outstanding expenses, expenses payable)	(xxx)
(-) Other Payables	(xxx)
A. Net Asset Value of Scheme	**xxx**
B. Number of outstanding units of scheme	**xxx**
C. NAV per unit of scheme (A/B)	**xxx**

B. Calculation of Closing Cash Balance:

Particulars	₹
Amount received from issue of new units	xxx
(-) Initial Investment in securities	(xxx)
(-) Initial Expenses	(xxx)
Opening Cash Balance	**xxx**
(+) Proceeds from sale of securities	xxx
(+) Final / Interim dividend received	xxx
(+) Interest received on securities / debentures	xxx
(-) Cost of securities purchased	(xxx)
(-) Operating expenses paid	(xxx)
(-) Capital gain distributed to unitholders	(xxx)
(-) Dividend distributed) to unitholders	(xxx)
Closing Cash Balance	**xxx**

Expense Ratio [Total Expense Ratio (TER)] & Sortino Ratio

Expense Ratio:

- Percentage of the assets that were spent to run a mutual fund.
- Includes mgmt. & advisory fees, travel costs, audit/custodian /registrar/ consultancy fees etc but does not include brokerage costs for trading the portfolio.

$$\frac{\text{Expense per Unit}}{\text{Average NAV per Unit}}$$

Sortino Ratio:

- A variation of Sharpe Ratio that considers and uses downside deviation instead of total standard deviation in denominator.

Calculation of Returns

1. Holding Period Return (HPR) in case of Dividend Pay-out Plan

$$\frac{\text{(Change in NAV + Dividend Income + Capital Gain)}}{\text{Beginning NAV}}$$

2. Annual return / Annual yield

$$\text{Effective Annual Return} = \text{HPR} \times \frac{\text{365 days / 12 months}}{\text{Holding Period}}$$

3. Holding Period Return (HPR) in case of Dividend Reinvestment & Bonus Plan

Step 1: Calculate the amount available for reinvestment
(Cash CG + Cash Dividend) x Number of units originally held

Step 2: Additional units issued (Purchase by investor)

$$\frac{\text{Reinvestment amount}}{\text{Price at issue (NAV of that date)}}$$

Step 3: Calculate Total closing NAV
$(N + N_D) \times NAV_1$ = Total value of all units at end

$$\text{HPR} = \frac{\text{Total Yield / Profit}}{\text{Investment Value in Beginning}} \times 100$$

Mutual Funds Schemes for earning Income

Dividend Pay-out	Dividend Reinvestment Plan	Bonus Plan	Growth Plan
Dividend is distributed to unitholders on regular basis	Dividend is not distributed to unitholders but it is reinvested into MF & units are issued to unitholders.	Dividend is not distributed to unitholders but bonus units are issued to unitholders	No Dividend or Bonus units are issued (Only Growth in NAV)

Format for Dividend Reinvestment Question

Date	Invest-ment (₹) (1)	Dividend Pay-out (%) (2)	Dividend Reinvested (Closing Units x Face value of ₹10 x Dividend Pay-out %) (3)	NAV (₹) (4)	Units	Closing Unit Balance Σ Units
	xxx			x	(1)/(4)	xxx
		x	xxx	x	(3)/(4)	xxx

Format for Bonus Plan Question:

Date	Units (1)	Bonus units (2) = (3) x Bonus Ratio	Total Balance (3) = (1) + (2)	NAV per unit (Given)
	x	-	xxx	x
		xxx	xxx	x

Dividend Equalization/ Income Equalization

For Incoming Unitholder		For Outgoing Unitholder	
Amount payable by Unitholder:		**Amount payable by MF:**	
NAV	xxx	NAV	xxx
Add: Entry Load	x%	**Less:** Exit Load	x%
Add: Dividend Equalization (for 7 months)	xxx	Add: Dividend Equalization (for 4 months)	xxx
Amount paid on issue	**xxx**	**Amount paid on Redemption**	**xxx**

Entry (Front-end) Load

You have to pay some extra amount over NAV when buying MF

Entry Load:

NAV + Entry Load% = Issue Price

Entry Load%

$$\frac{\text{Issue Price} - \text{NAV}}{\text{NAV}} \times 100$$

Exit (Back-end) Load

You get amount **lower than NAV** when you sell MF

Exit Load:

NAV - Exit Load% = Redemption Price

Exit Load%

$$\frac{\text{NAV} - \text{Redemption Price}}{\text{NAV}} \times 100$$

Tracking Error

Check the performance of portfolio manager, hence a benchmark is given.

Tracking Error

$$\sqrt{\frac{\sum[x-\bar{x}]^2}{n-1}} \text{ OR } \sqrt{\frac{\sum(x-\bar{x})^2}{n}}$$

Steps:

- Calculate Average Active Return
- Calculate Tracking Error
- Calculate Information Ratio:

Average Active Return/ Tracking Error
Tracking Error

Hedge Fund

Hedge Fund (HF) is **less / lightly regulated investment fund** than others

Fees charged by Hedge Fund Managers

- Fixed Fees / Management Fees → Fixed % of assets (irrespective of positive / negative return on fund)
- Incentive Fees → Linked to the performance of fund. (**Return in excess of the maximum value achieved at inception**)

Concept of Calculating Beta

Return of market x β_p = Return of Portfolio

Beta of Portfolio β_p = $\frac{\sigma_p}{\sigma_m} \times \gamma$

= $\frac{\text{Standard deviation of portfolio}}{\text{Standard deviation of market}}$ x correlation between portfolio & market

Calculation of Dividend Equalization per unit

Particulars	No. of Units	Per Unit Income (₹)	Total Income (₹)
Income earned by MF (Jan)	No of units at opening date	Calculate	Given
Add: Dividend Equalization collected on issue of new units	No. of units issued	Above same value	Calculate
	Total	Calculate	Total
Income earned by MF (Feb)	-	Calculate	Given
	Total	Calculate	Total
Less: Dividend Equalization paid on repurchase of units	No. of units repurchased	Above same value	Calculate
	Total	Calculate	Total
Add: Income earned by MF (Mar)	-	Calculate	Given
Income available for distribution	Total	Calculate	Total
Less: Dividend paid	-	xxx	xxx
Income available for distribution	**Total**	**Calculate**	**Total**

Indifference Return

The return on MF is that the investor would be indifferent on direct investment through equity (stock market) or indirect investment through mutual fund.

R_1 = Return earned by investor on direct investment through equity / stock market %

$$R_2 = \frac{R_1}{1 - \text{Initial expense in MF\%}} + \text{Recurring Expense in MF \%}$$

Financial Measures

Sharpe Ratio (Reward to Variability Ratio):

$$\text{Sharpe Ratio} = \frac{(R_p - R_f)}{\sigma_p} = \frac{\text{Excess Return over } R_F}{\text{Total Risk}}$$

- How much extra you have earned by 1 unit of total risk.

Treynor's Ratio (Reward to Volatility Ratio)

$$\text{Treynor's Ratio} = \frac{(R_p - R_f)}{\beta} = \frac{\text{Excess Return over } R_F}{\text{Systematic Risk}}$$

- How much extra you have earned by 1 unit of systematic risk.

Jensen's Alpha

$\alpha_p = R_p - (R_f + \beta (ER_m - R_p)$

= Actual return of portfolio – Expected Return