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STRATEGIC FINANCIAL MANAGEMENT (SFM)

Derivatives (F&O)

By CA GAURAV JAIN

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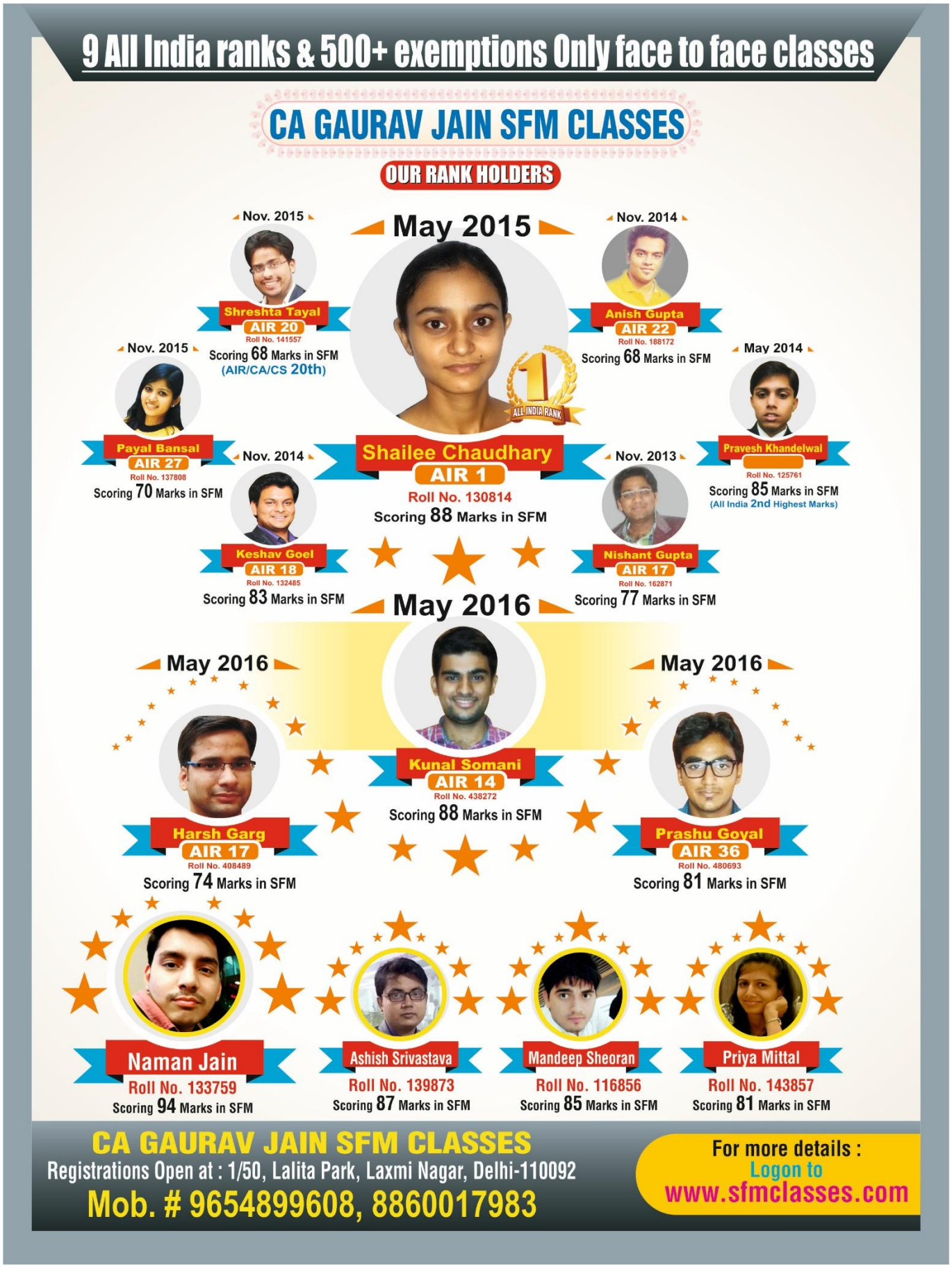
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AIR 22
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AIR 27
Roll No. 137808
Scoring 70 Marks in SFM
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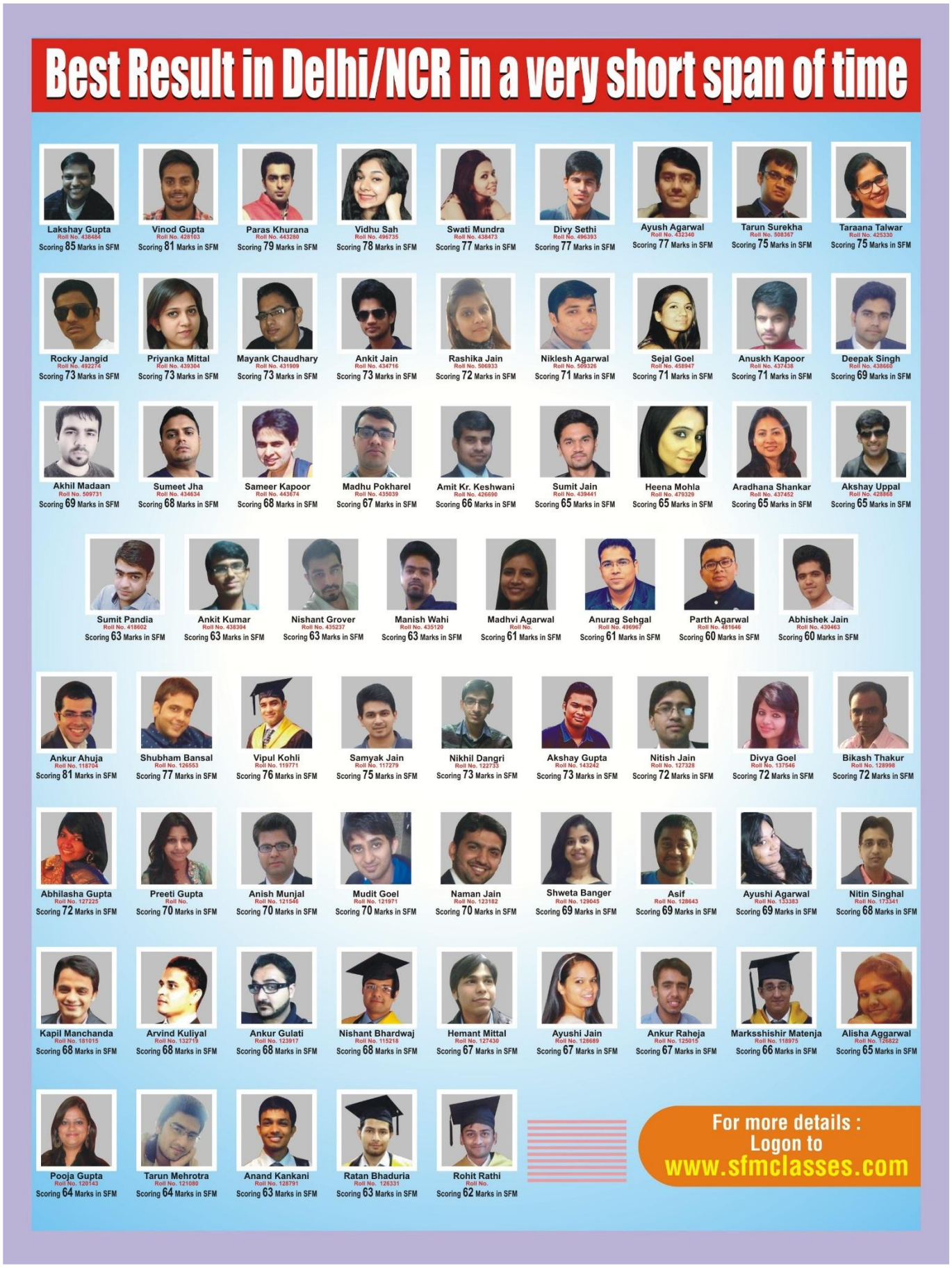
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Comparison between CA FINAL SFM Old & New Course

No. of Amendment Classes required for transition between Old & new Course = 13

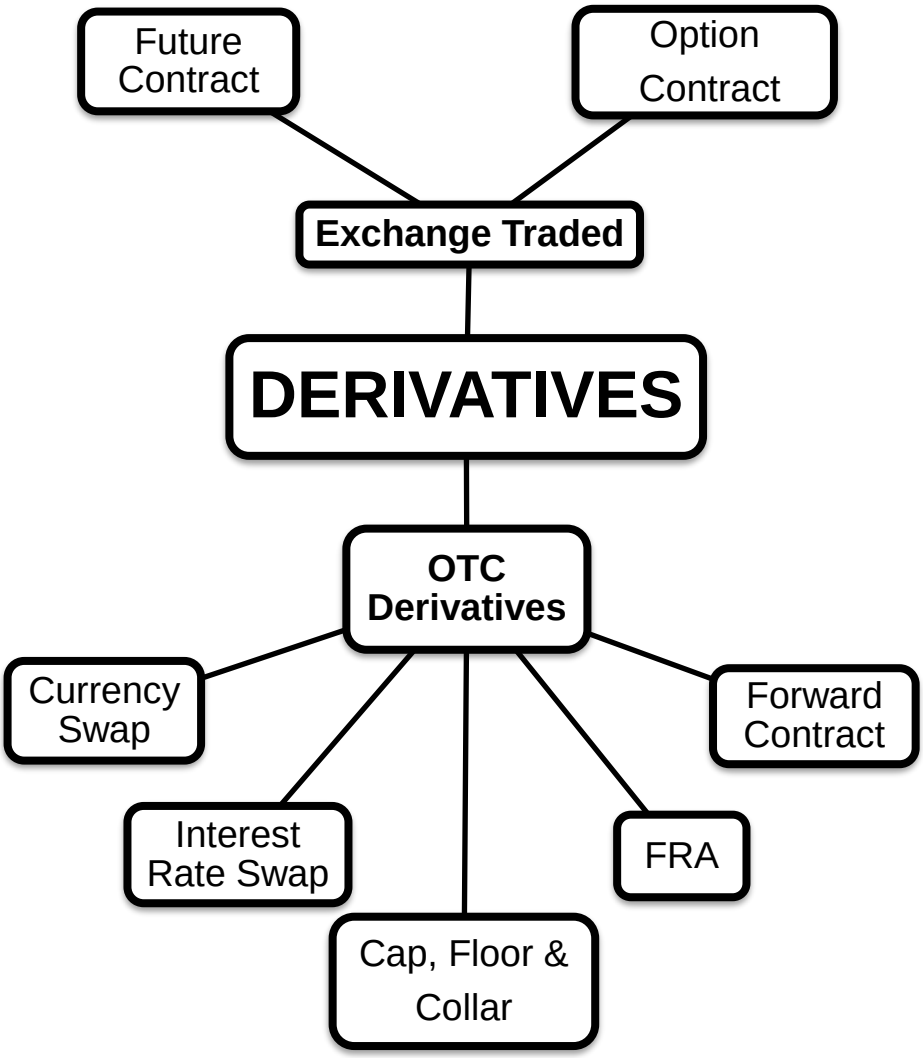
[10 Classes for Practical Topics & 3 Classes for Theory]

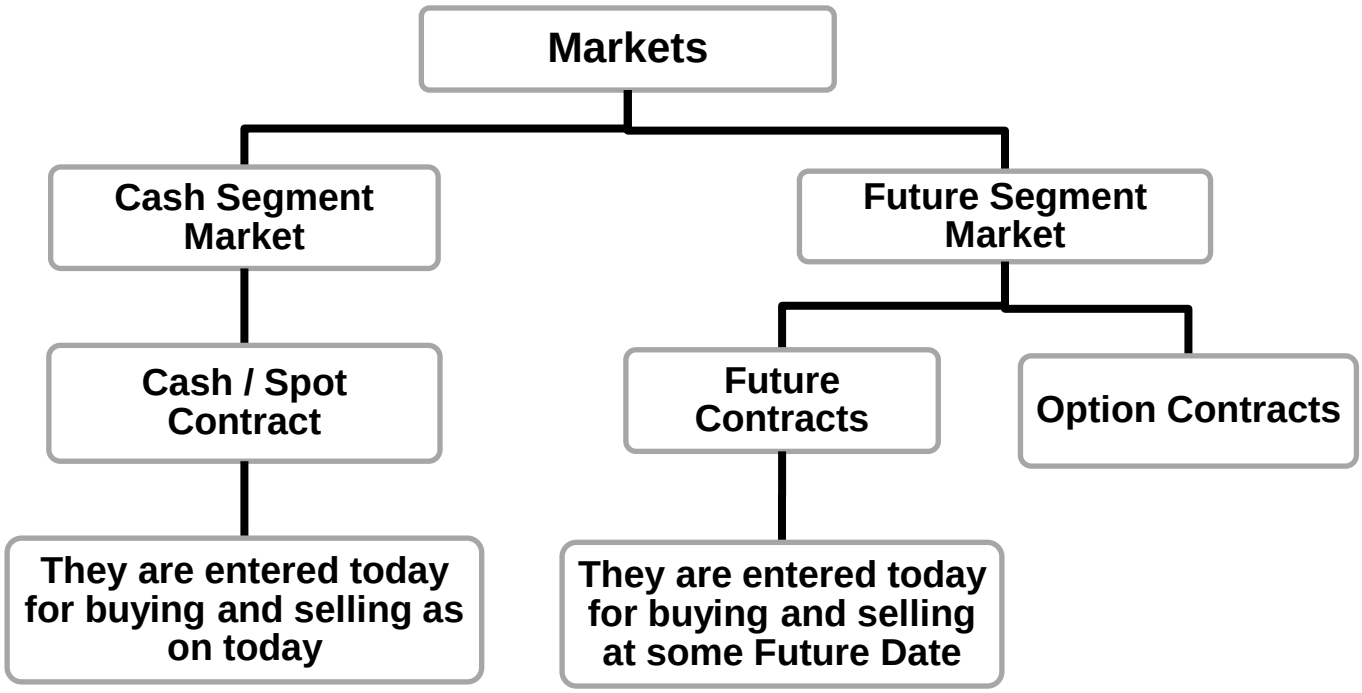
Chapters Sr. No.	Name as per New course	COMMENT	No. of amendment classes required
1	Financial Policy & Corporate strategy	Same as per old course	
2	Indian Financial System*	Theory Chapter	
3	Risk Management*	Theory + Simple Calculation of VAR	2
4	Security Analysis	Same as per old course Some topic transfer from Portfolio theory	1
5	Security Valuation	Already covered in old course in the name of Bond Valuation + Equity/Business Valuation New Topic Enterprise Value introduced	1
6	Portfolio Management	Same as per old syllabus New Topic 1) Fixed Income Portfolio Management 2) Alternative Investment Strategies	2
7	Securitization	Theory Chapter	
8	Mutual Funds	Same as per old syllabus	
9	Derivatives Analysis & Valuation	Same as per old syllabus	
10	Foreign Exchange exposure & Risk Management	Same as per old syllabus	
11	International Financial Management	Same as per old syllabus (International Capital Budgeting)	2
12	Interest Rate Risk Management	Same as per old syllabus (1 or 2 additions)	1
13	Corporate Valuation	Same as per old syllabus (2 Topics Added)	1
14	Merger, Acquisition & Corporate Restructuring	Same as per old syllabus	
15	International Financial Centre(IFC)*	Theory Chapter	
16	Startup Finance*	Theory Chapter	
17	Small & Medium Enterprises*	Theory Chapter	

* New Chapters introduced

DERIVATIVES (F & O)

Concept No. 1: Introduction





➔ **Define Forward Contract, Future Contract.**

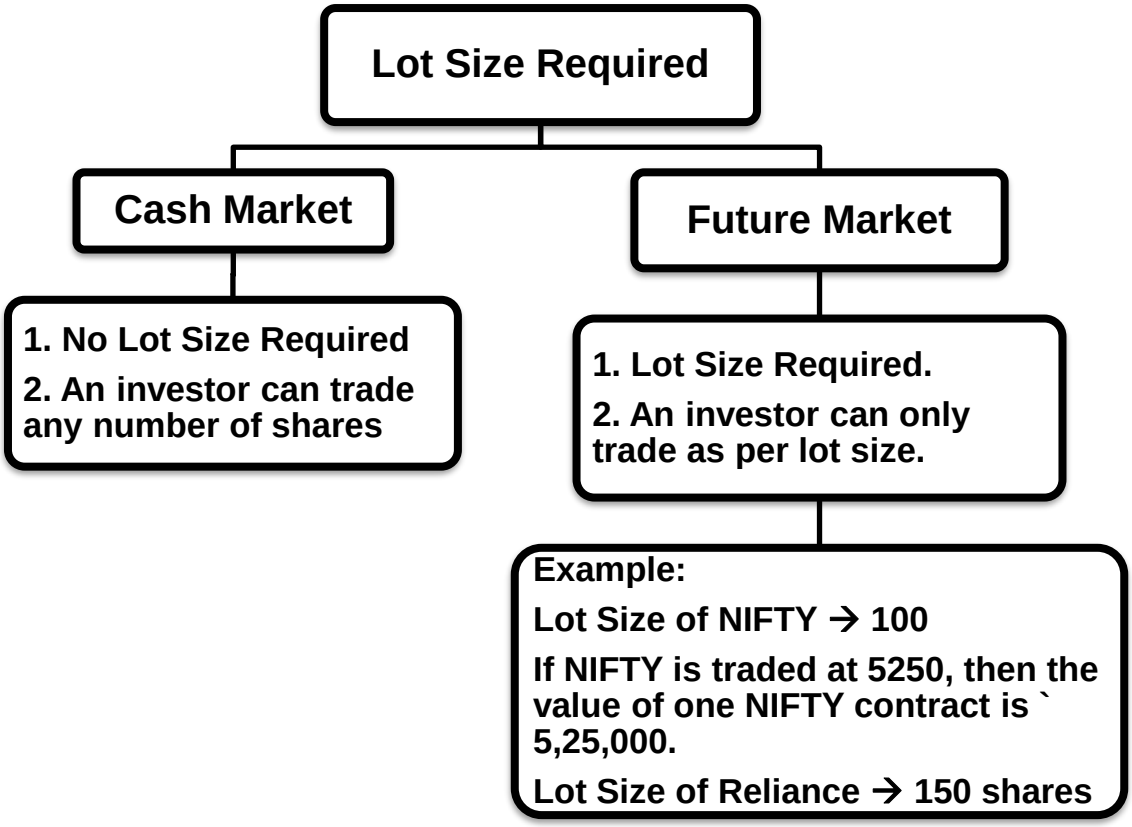
- **Forward Contract**, In Forward Contract one party agrees to buy, and the counterparty to sell, a physical asset or a security at a specific price on a specific date in the future. If the future price of the assets increases, the buyer(at the older, lower price) has a gain, and the seller a loss.

- **Futures Contract** is a standardized and exchange-traded. The main difference with forwards are that futures are traded in an active secondary market, are regulated, backed by the clearing house and require a daily settlement of gains and losses.

➔ **Future Contracts differ from Forward Contracts in the following ways:**

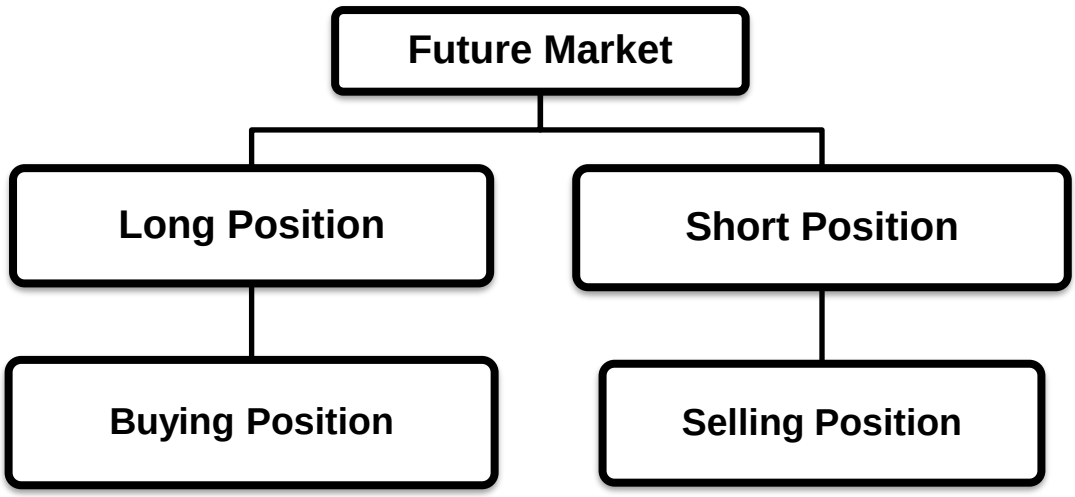
Future Contracts	*Forward Contracts*
❖ Organized exchange	Private contracts
❖ Highly standardized ➢ Lot size requirement ➢ Expiry Date ➢ MTM	Customized contracts
❖ No counterparty default risk.	Counterparty default risk exists.
❖ Government regulates	Usually not regulated.

Note:



- ***Participants in the Derivative Market***
  - ***Hedgers***
  - ***Speculators***
  - ***Arbitrators***

Concept No. 2: Position to be taken under Future Market



How to settle/ square-off/ covering/ closing out a position

- Long Position should be settled by Short position to calculate Profit/ Loss.
- Short Position should be settled by Long position to calculate Profit/ Loss.

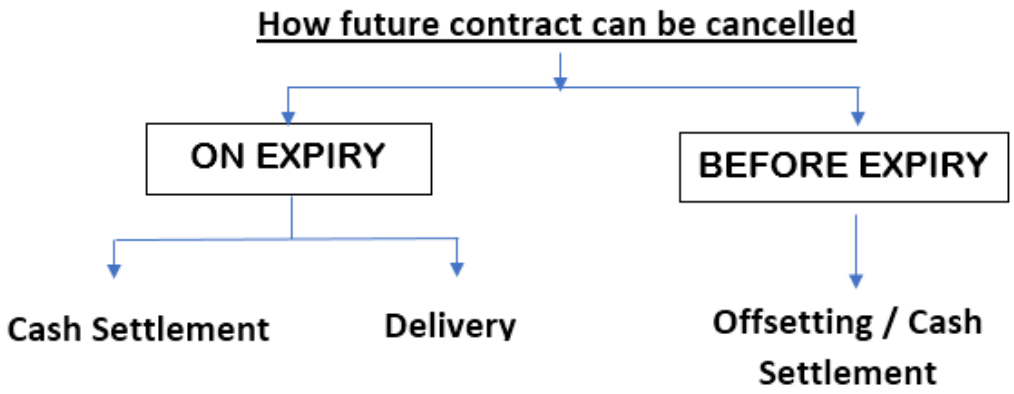
Concept No. 3: Gain or Loss under Future Market

Position	If Price on Maturity/ Settlement Price	Gain/ Loss
Long Position	Increase	Gain
	Decrease	Loss
Short Position	Increase	Loss
	Decrease	Gain

Note:

- Gain/Loss is net of brokerage charge. Brokerage is paid on both buying & selling.
- Security Deposit is not considered while calculating Profit & Loss A/c.
- Interest paid on borrowed amount must be deducted while calculating Profit & Loss.
- A Future contract is **ZERO-SUM Game**. Profit of one party is the loss of other party.

Concept No. 4 : How Future Contract can be terminated at or prior to expiration?



- A short can terminate the contract by delivering the goods, and a long can terminate the Contract by accepting delivery and paying the contract price to the short. This is called **Delivery**. The location for delivery (for physical assets), terms of delivery, and details of exactly what is to be delivered are all specified in the contract.

- In a **cash-settlement contract**, delivery is not an option. The futures account is marked-to-market based on the settlement price on the last day of trading.

- You may make a **reverse**, or **offsetting**, trade in the future market. With futures, however, the other side of your position is held by the clearinghouse- if you make an exact opposite trade(maturity, quantity, and good) to your current position, the clearinghouse will net your positions out, leaving you with a zero balance. This is how most futures positions are settled.

Concept No. 5: Difference between Margin in the cash market and Margin in the future markets and Explain the role of initial margin, maintenance margin

- In **Cash Market**, margin on a stock or bond purchase is 100% of the market value of the asset.

- Initially, 50% of the stock purchase amount may be borrowed and the remaining amount must be paid in cash (Initial margin).
- There is interest charged on the borrowed amount.

➢ In **Future Markets**, margin is a performance guarantee i.e. security provided by the client to the exchange. It is money deposited by both the long and the short. There is no loan involved and consequently, no interest charges.

- The exchange requires traders to post margin and settle their account on a daily basis.

Initial Margin	Maintainance Margin	Variation Margin
Money deposited in a futures account before any trading takes place and paid by both Long & Short position	Amount of margin that must be maintained. If the margin balance falls below the MM due to the change in the Contract Price, additional fund must be deposited to bring the margin balance back-up to the initial margin requirement.	Amount which the trader has to bring when maintainance margin is breached.

1. Initial Margin

- It is the money that must be deposited in a futures account before any trading takes place and paid by both long and short position.
- It is set for each type of underlying asset.
- Initial Margin per contract is relatively low and equals about one day's maximum price fluctuation on the total value of the contract.

2. Maintenance Margin

- It is the amount of margin that must be maintained in a futures account. i.e. It is a limit below which our closing balance should not fall.
- If the initial margin balance in the account falls below the maintenance margin due to the change in the contract price, **additional fund must be deposited to bring the margin balance back-up to the initial margin requirement**.

3. Variation Margin

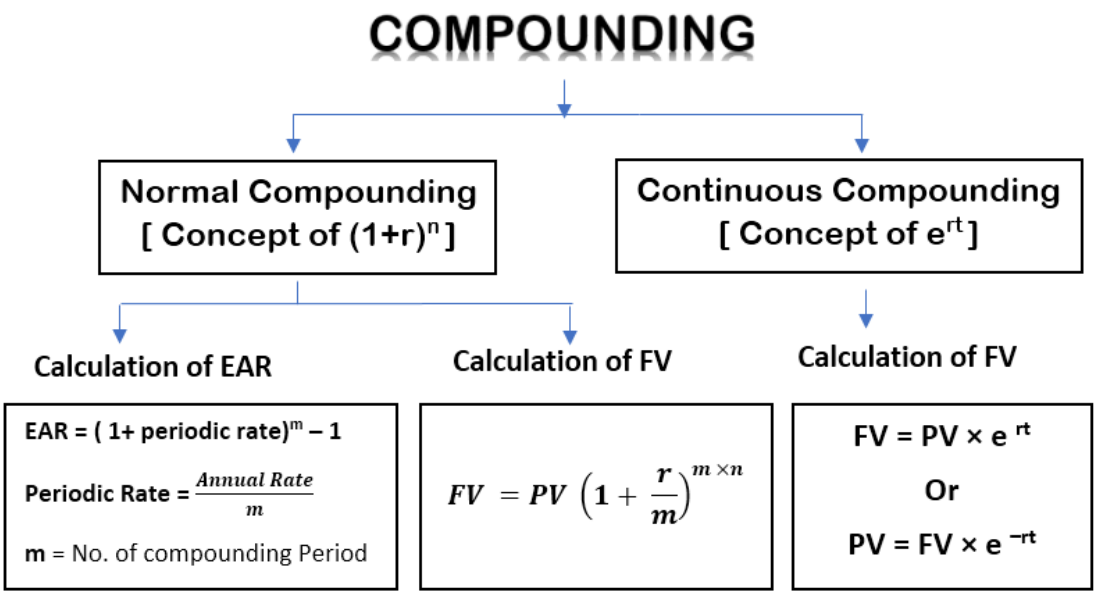
- It is the amount which the trader has to bring when the maintenance margin is breached.

Note:

- Any amount, over & above initial margin amount can be withdrawn.
- If Initial Margin is not given in the question, then use:

Initial Margin = Daily Absolute Change + 3 Standard Deviation

Concept No. 6: Concept of COMPOUNDING



- The rate of interest that investor actually realize as a result of compounding is known as the **Effective Annual Rate (EAR).**

- EAR represents the annual rate of return actually being earn after adjustments have been made for different compounding periods.

EAR = (1+ periodic rate) ^{m} – 1

Where:

Periodic rate = $\frac{\text{stated annual rate}}{m}$

m = the number of compounding periods per year

- Greater the compounding Frequency, the greater the EAR will be in comparison to stated rate.
- For Normal Compounding use,

$$FV = PV\left(1+\frac{r}{m}\right)^{m\times n}$$

Concept No. 7: Concept of e^{rt} & e^{-rt} (Continuous Compounding)

Most of the financial variable such as Stock price, Interest rate, Exchange rate, Commodity price change on a real time basis. Hence, the concept of Continuous compounding comes in picture. Continuous Compounding means compounding every moment. Instead of (1 + r) we will use e^{rt}

- Under Future & Options Chapter, it is normally assumed that interest rate is compounded continuously (i.e. infinite times)

$$FV = PV\left(1+\frac{r}{\alpha}\right)^{\alpha}$$

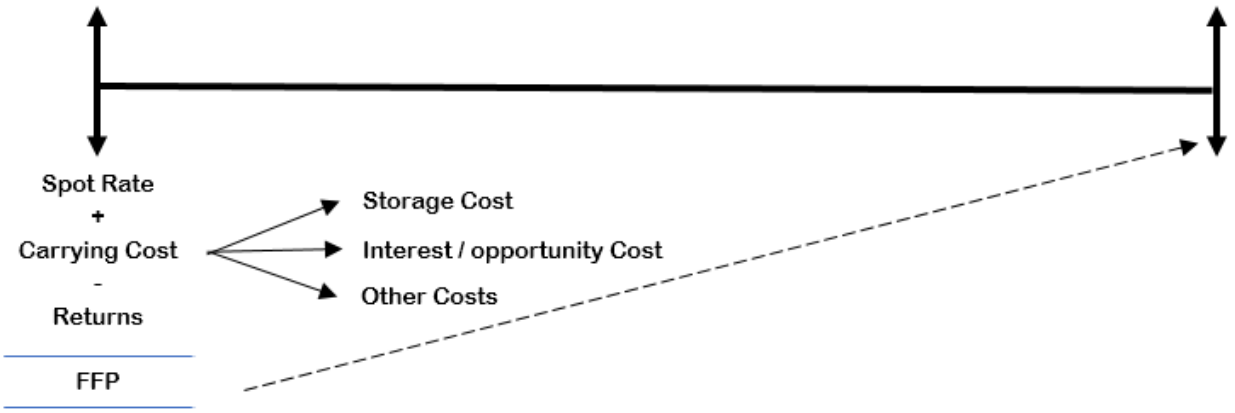
FV = PV × e ^{rt}

Or present value = $\frac{FV}{e^{rt}}$

Or **PV = FV × e $^{-rt}$**

Where r = rate of interest p.a
t = time period

Valuation Rules



Concept No. 8: Fair future price of security with no income

In case of Normal Compounding

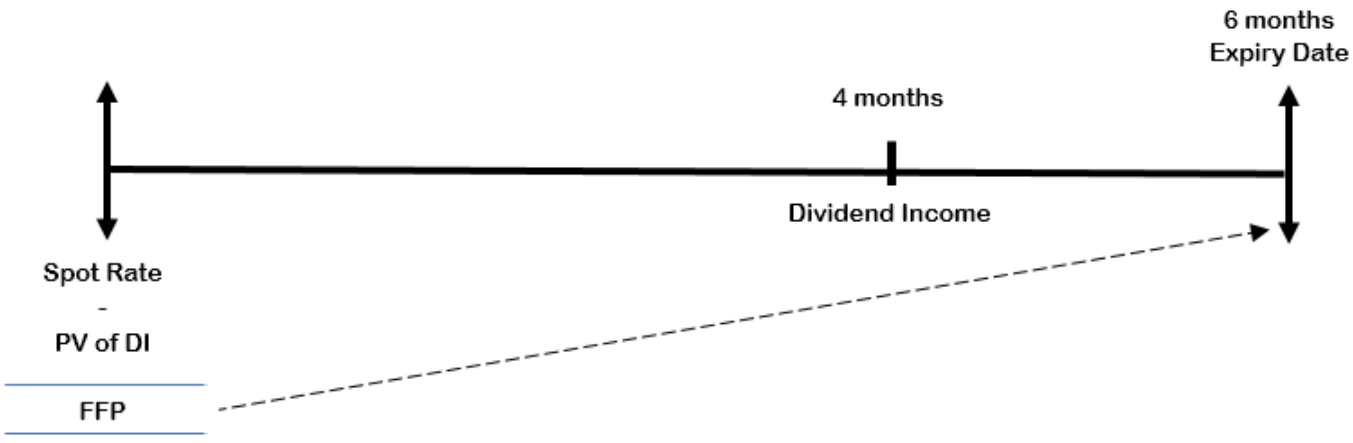
Fair future price = Spot Price $(1+r)^n$

In case of Continuous Compounding

Fair future price = Spot Price × e ^{rt}

Where r = risk free interest p.a. with Continuous Compounding.
t = time to maturity in years/ days. (No. of days / 365) or (No. of months / 12)

Concept No. 9: Fair Future Price of Security with Dividend Income



In case of Normal Compounding

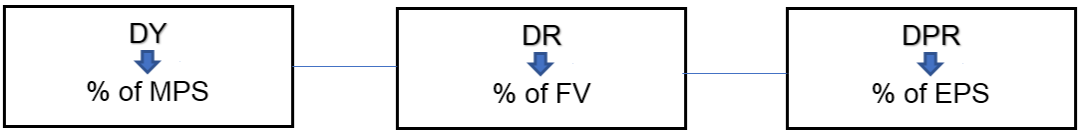
$$\text{Fair Future Price} = [\text{Spot Price} - \text{PV of Expected Dividend}] (1+r)^n$$

In case of Continuous Compounding

$$\text{Fair Future Price} = [\text{Spot Price} - \text{PV of Expected Dividend}] \times e^{rt}$$

PV of DI = Present Value of Dividend Income = Dividend $\times e^{-rt}$
Where t = period of dividend payments

Concept No. 10: Fair Future Price of security when income is expressed in percentage or when dividend yield is given



In case of Normal Compounding

$$\text{Fair Future Price} = \text{Spot Price}\,[1+(r-y)]^n$$

In case of Continuous Compounding

$$\text{Fair Future Price} = \text{Spot Price} \times e^{(r-y)\times t}$$

Where y = income expressed in % or dividend Yield

Note:

If percentage income is given, it is assumed to be given on per annum basis.

Concept No. 11: Fair Future Price of Commodity with storage cost

It is applicable in case of Commodity futures.

In case of Normal Compounding

Fair Future Price = [Spot Price + PV of S.C] $(1+r)^n$

In case of Continuous Compounding

Fair Future Price = [Spot Price + PV of S.C] $\times e^{rt}$
Where PV of S.C = Present Value of Storage Cost

Note: Fair Future Price when Storage Cost is given in percentage(%).

FFP = Spot Price $\times e^{(r+s)\times t}$
Where S = Storage cost expressed in percentage.

Concept No. 12: Fair Future Price of commodities with Convenience yield expressed in % (Similar to Dividend Yield)

- Applicable in case of Commodity futures.
- The benefit or premium associated with holding an underlying product or physical good rather than contract or derivative product i.e. extra benefit that an investor receives for holding a commodity.

In case of Continuous Compounding

Fair Future Price = Spot Price × $e^{(r-c)\times t}$

Note: **Fair Future Price when convenience income is expressed in Absolute Amount.**

Fair Future Price = [Spot Price - PV of Convenience Income] × e^{rt}

Concept No. 13: Arbitrage Opportunity between Cash and Future Market

- Arbitrage is an important concept in valuing (Pricing) derivative securities. In its Purest sense, arbitrage is riskless.
- Arbitrage opportunities arise when assets are mispriced. Trading by Arbitrageurs will continue until they effect supply and demand enough to bring asset prices to efficient(no arbitrage) levels.
- Arbitrage is based on "Law of one price". Two securities or portfolios that have identical cash flows in future, should have the same price. If A and B have the identical future pay offs and A is priced lower than B, buy A and sell B. You have an immediate profit.

Difference between Actual Future Price and Fair Future Price?

Fair Future Price is calculated by using the concept of Present Value & Future Value.
Actual Future Price is actually prevailing in the market.

Case	Value	Future Market	Cash Market	Borrow/ Invest	Interest	Dividend
FFP < AFP	Over-Valued	Sell or Short Position	Buy	Borrow	Cost	Income
FFP > AFP	Under-Valued	Buy or Long Position	Sell #	Investment	Income	Cost

Here we assume that Arbitrager hold shares

Concept No. 14: Complete Hedging by using Index Futures & Beta

- Hedging is the process of taking an opposite position in order to reduce loss caused by Price fluctuation.
- The objective of Hedging is to reduce Loss.
- Complete Hedging means profit/ Loss will be Zero.

Position to be taken:

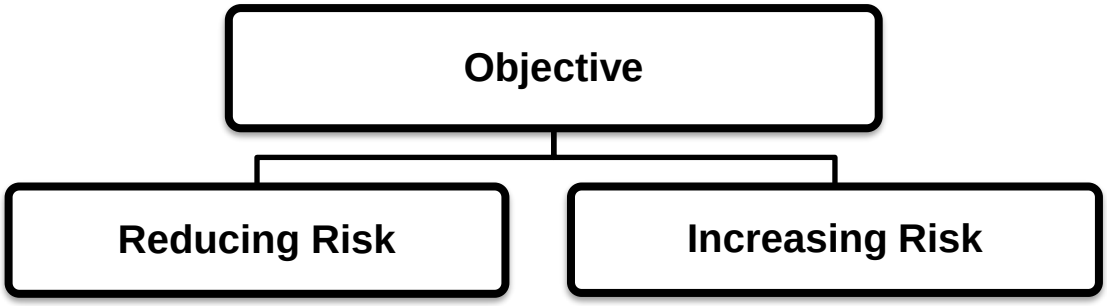
1. Long Position should be hedged by Short Position.
2. Short Position should be hedged by Long Position.

Value of Position to be taken:

Value of Position for Complete hedge should be taken on the basis of **Beta** through index futures.

Value of Position for Complete Hedge = Current Value of Portfolio × Existing Stock Beta

Concept No. 15: Value of Hedging/Position for Increasing & Reducing Beta to a Desired Level



Step 1 : Decide Position

Case 1 : To Reduce Risk

Long Position → **Short Index Future**

Short Position → **Long Index Future**

Case 2 : To Increase Risk

Long Position → **Long Index Future**

Short Position → **Short Index Future**

Step 2 : Value of Position

Alternative 1 (Hedging Using Index Future)

Case I: When Existing Beta > Desired Beta

Objective: Reducing Risk

Value of Index Position = Value of Existing Portfolio × [Existing Beta – Desired Beta]

Action: Take Short Position in Index & keep your current position unchanged.

Case II: When Existing Beta < Desired Beta

Objective: Increase Risk

Value of Index Position = Value of Existing Portfolio × [Desired Beta – Existing Beta]

Action: Take Long Position in Index & keep your current position unchanged

Step 3 :

No. of future contracts to be sold or purchased for increasing or reducing Beta to a Desired Level using Index Futures.

No. of Future Contract to be taken = $\frac{\text{Value of Index Position}}{\text{Value of one Future Contract}}$

Alternative 2 (Hedging Using Risk free Investment or Borrowing)

Case 1: Reducing Risk

SELL SOME SECURITIES AND REPLACE WITH RISK-FREE INVESTMENT

Step1: Equate the weighted Average Beta formulae to the new desired Beta

Desire Beta = $Beta_1 \times W_1 + Beta_2 \times W_2$ (Beta of Risk free investment is Zero)

Step2: Use the weights and decide

Case 2: Increasing Risk

BUY SOME SECURITIES AND BORROW AT RISK-FREE RATE

Step1: Equate the weighted Average Beta formulae to the new desired Beta

Desire Beta = $Beta_1 \times W_1 + Beta_2 \times W_2$ (Beta of Risk free investment is Zero)

Step2: Use the weights and decide

Concept No. 16: Partial Hedge

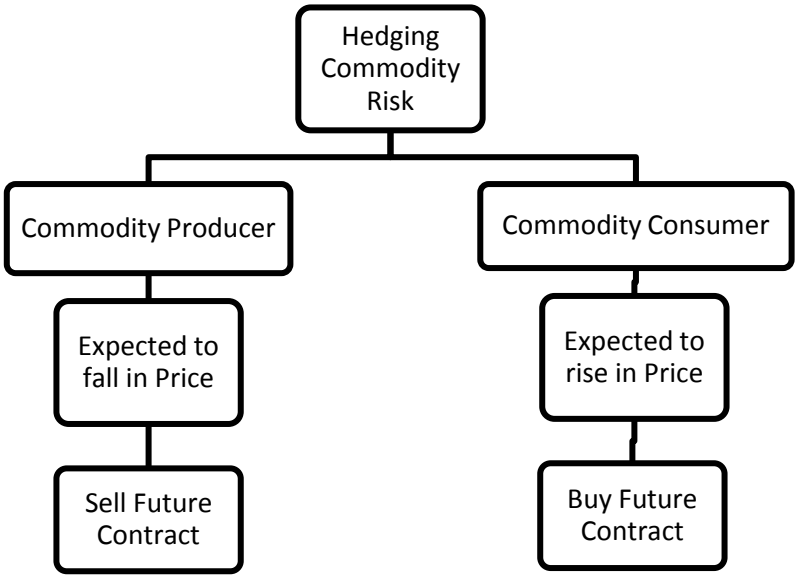
Value of existing Portfolio × Existing beta × percentage (%) to be Hedge

- It result into Over-Hedged or Under-Hedged Position
- There may be profit or loss depending upon the situation.

Concept No. 17: Beta of a Cash and Cash Equivalent

Beta of a cash and Risk free security is Zero.

Concept No. 18: Hedging Commodity Risk Through Futures



Concept No. 19: Calculation of Rate of Return

	Increase or Decrease in Stock Price ($P_1 - P_0$)
(+)	Dividend Received
(-)	Transaction Cost
(-)	Interest Paid on Borrowed Amount
	Net Amount Received

Rate of return:

$$\frac{\textbf{Net Amount Received}}{\textbf{Total Initial Equity Investment}} \times 100$$

Concept No. 20: Hedge Ratio

The Optional Hedge Ratio to minimize the variance of Hedger's position is given by:-

Hedge Ratio = Corr. (r) $\frac{\sigma_S}{\sigma_F}$

σ_S = S.D of Δ S
σ_F = S.D of Δ F
r = Correlation between Δ S and Δ F
Δ S = Change in Spot Price
Δ F = Change in Future Price