

NCFM Modules

By Prof. Amarpreet Singh

bangaamar@hotmail.com

NSE's Certification in Financial Markets (NCFM)

NCFM currently tests expertise in the following modules.

► **Stock Broking, Trading and Settlement**

1. Financial Markets: A Beginner's Module
2. Securities Market (Basic) Module
3. Currency Derivatives: A Beginner's Module
4. Interest Rate Derivatives: A Beginner's Module
5. Equity Derivatives: A Beginner's Module
6. Capital Market (Dealers) Module
7. Derivatives Market (Dealers) Module
8. Commodities Market Module
9. Options Trading Strategies Module
10. NSDL-Depository Operations Module
11. Issue Management Module

▶ **Research and Analysis**

1. Equity Research Module
 2. Financial Modelling Module
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▶ **Financial Planning and Investment Management**

1. Modules of Financial Planning Standards Board India (Certified Financial Planner Certification)
2. Financial Services Marketing Module
3. Mutual Funds: A Beginner's Module
4. Investment Analysis and Portfolio Management
5. Certified Personal Financial Advisor (CPFA) Examination

▶ **Risk Management**

1. Compliance Officers (Brokers) Module
2. Compliance Officers (Corporates) Module
3. Information Security Auditors Module (Part-1) & Information Security Auditors Module (Part-2)
4. Surveillance in Stock Exchanges Module
5. Market Risk Module
6. Corporate Governance Module

▶ **Banking**

1. Commercial Banking in India : A Beginner's Module

▶ **Debt Market**

1. FIMMDA-NSE Debt Market (Basic) Module



Equity Derivatives-NCFM Basic Module



Equity Derivatives: A Beginner's Module

- ▶ This module has been prepared with a view to equip candidates with basic but essential information and concepts regarding the equity derivatives markets.
 - ▶ **Why should one take this course?**
 - ▶ To understand the concept of derivative.
 - ▶ To learn the types of derivative products and their application.
 - ▶ To learn about the trading of derivatives on the stock exchanges.
 - ▶ **Who will benefit from this course?**
 - ▶ Students
 - ▶ Teachers
 - ▶ Employees of Brokers/Sub-brokers
 - ▶ Individual Investors
 - ▶ Employees of BPOs/IT companies
 - ▶ Anybody having interest in the derivatives market
 - ▶ **Test details**
 - ▶ Duration: 120 minutes
 - ▶ No. of questions: 60
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- ▶ 5 ▶ Maximum marks: 100, Passing marks: 50 (50%); There is no negative marking in this module.
- ▶ Certificate validity: For successful candidates, certificates are valid for 5 years from the test date

Topics

Chapter No.	Title	Weights (%)
1	Introduction	15
2	Definitions of Basic Derivatives	15
3	Applications of Derivatives	10
4	Trading Futures	20
5	Trading Options	20
6	Derivatives Trading on Exchange	20

Introduction

- **Definition of Derivatives**

- The term “derivatives” is used to refer to financial instruments which derive their value from some underlying assets. The underlying assets could be equities (shares), debt (bonds, T-bills, and notes), currencies, and even indices of these various assets, such as the Nifty 50 Index.
- Thus if a derivative’s underlying asset is equity, it is called Equity derivative and so on.

Difference in Share and Derivative

- ▶ The difference is that while shares are assets, derivatives are usually contracts (the major exception to this are warrants and convertible bonds, which are similar to shares in that they are assets).
- ▶ We can define financial assets (e.g. shares, bonds) as: claims on another person or corporation; they will usually be fairly standardized and governed by the property or securities laws in an appropriate country.
- ▶ On the other hand, a contract is merely: an agreement between two parties, where the contract details may not be standardized.

Why Do We Call Them Derivatives?

- ▶ They owe their existence to the presence of a market for an underlying asset or portfolio of assets, which may be considered as primary securities.
- ▶ Consequently such contracts are derived from these underlying assets, and hence the name.
- ▶ Thus if there were to be no market for the underlying assets, there would be no derivatives.

What do derivatives do?

- Derivatives attempt either to **minimize the loss** arising from adverse price movements of the underlying asset
- Or **maximize the profits** arising out of favorable price fluctuation. Since derivatives derive their value from the underlying asset they are called as derivatives.

How are derivatives used?

- Derivatives are basically **risk shifting** instruments. Hedging is the most important aspect of derivatives and also their basic economic purpose
- Derivatives can be compared to an insurance policy. As one pays premium in advance to an insurance company in protection against a specific event, the derivative products have a payoff contingent upon the occurrence of some event for which he pays premium in advance.

What is Risk?

- The concept of risk is simple. It is the potential for change in the price or value of some asset or commodity.
- The meaning of risk is not restricted just to the potential for loss. There is upside risk and there is downside risk as well.

What is a Hedge?

- To Be cautious or to protect against loss.
- In financial parlance, hedging is the act of reducing uncertainty about future price movements in a commodity, financial security or foreign currency .
- Thus a hedge is a way of insuring an investment against risk.

Origin of derivatives

- The first “futures” contracts can be traced to the Yodoya rice market in Osaka, Japan around 1650.
- The farmers were afraid of rice prices falling in the future at the time of harvesting. To lock in a price (that is, to sell the rice at a predetermined fixed price in the future), the farmers entered into contracts with the buyers.
- These were evidently standardized contracts, much like today’s futures contracts.

• Derivatives in India

- Derivatives markets have been functioning since the nineteenth century, with organized trading in cotton through the establishment of the Cotton Trade Association in 1875.
- Derivatives, as exchange traded financial instruments were introduced in India in June 2000.
- The National Stock Exchange (NSE) is the largest exchange in India in derivatives, trading in various derivatives contracts.
- The first contract to be launched on NSE was the Nifty 50 index futures contract. In a span of one and a half years after the introduction of index futures, index options, stock options and stock futures were also introduced in the derivatives segment for trading. NSE's equity derivatives segment is called the Futures & Options Segment or F&O Segment. NSE also trades in Currency and Interest Rate Futures contracts under a separate segment.

Milestones in the development of Indian derivative market

Nov-96	L.C. Gupta Committee set up to draft a policy framework for introducing derivatives
May-98	L.C. Gupta committee submits its report on the policy framework
May-00	SEBI allows exchanges to trade in index futures
Jun-00	Trading on Nifty futures commences on the NSE
Jun-01	Trading for Nifty options commences on the NSE
Jul-01	Trading on Stock options commences on the NSE
Nov-01	Trading on Stock futures commences on the NSE
Aug-08	Currency derivatives trading commences on the NSE
Aug-09	Interest rate derivatives trading commences on the NSE
Feb-10	Launch of Currency Futures on additional currency pairs
Oct-10	Introduction of European style Stock Options
Oct-10	Introduction of Currency Options



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- The Securities Contracts (Regulation) Act, 1956 defines "derivatives" to include:
 - A security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument, or contract for differences or any other form of security.
 - A contract which derives its value from the prices, or index of prices, of underlying securities.

Basic forms of derivatives

➤ Forwards

➤ Futures

➤ Options

➤ Forwards

- A **forward** contract or simply a forward is a contract between two parties to buy or sell an asset at a certain future date for a certain price that is pre-decided on the date of the contract.
- Forward contracts are traded only in Over the Counter (OTC) market and not in stock exchanges. OTC market is a private market where individuals/institutions can trade through negotiations on a one to one basis.

➤ Example 1

- Jay and Viru enter into a contract to trade in one stock on Infosys 3 months from today the date of the contract @ a price of Rs 4675/-
- Note: Product ,Price ,Quantity & Time have been determined in advance by both the parties.
- Delivery and payments will take place as per the terms of this contract on the designated date and place. This is a simple example of forward contract.

Settlement of forward contracts

➤ Physical Settlement

- A forward contract can be settled by the physical delivery of the underlying asset by a short investor (i.e. the seller) to the long investor (i.e. the buyer) and the payment of the agreed forward price by the buyer to the seller on the agreed settlement date. The following example will help us understand the physical settlement process.

➤ Illustration

- Consider two parties (A and B) enter into a forward contract on 1 August, 2009 where, A agrees to deliver 1000 stocks of Unitech to B, at a price of Rs. 100 per share, on 29 th August, 2009 (the expiry date). In this contract, A, who has committed to sell 1000 stocks of Unitech at Rs. 100 per share on 29th August, 2009 has a short position and B, who has committed to buy 1000 stocks at Rs. 100 per share is said to have a long position.
- In case of physical settlement, on 29th August, 2009 (expiry date), A has to actually deliver 1000 Unitech shares to B and B has to pay the price ($1000 * \text{Rs. } 100 = \text{Rs. } 10,000$) to A. In case A does not have 1000 shares to deliver on 29th August, 2009, he has to purchase it from the spot market and then deliver the stocks to B .

Scenario I.

Closing Spot price of Unitech is Rs 105

- Since the short investor B has sold Unitech at Rs. 100 in the Forward market on 1 August, 2009,
- He can buy 1000 Unitech shares at Rs. 105 from the market and deliver them to the long investor B. Therefore the person who has a short position makes a loss of $(100 - 105) \times 1000 = \text{Rs. } 5000$.
- If the long investor sells the shares in the spot market immediately after receiving them, he would make an equivalent profit of $(105 - 100) \times 1000 = \text{Rs. } 5000$.

➤ Cash Settlement

- Cash settlement does not involve actual delivery or receipt of the security
- Each party either pays (receives) cash equal to the net loss (profit) arising out of their respective position in the contract.
- In our example, A will simply pay Rs. 5000 to B on the expiry date.
- Please note that the profit and loss position in case of physical settlement and cash settlement is the same except for the transaction costs which is involved in the physical settlement.

Default risk in forward contracts

- The contract is for physical or cash settlement, there exists a potential for one party to default, i.e. not honor the contract.
- It could be either the buyer or the seller. This results in the other party suffering a loss.
- This risk of making losses due to any of the two parties defaulting is known as counter party risk.
- The main reason behind such risk is the absence of any mediator between the parties, who could have undertaken the task of ensuring that both the parties fulfill their obligations arising out of the contract
- E.g. Jay owned one share of Infosys and the price went up to 4750/- three months hence, he profits by defaulting the contract and selling the stock at the market.

Futures

- ▶ Futures contract is an agreement between two parties in which the buyer agrees to buy an underlying asset from the seller, at a future date at a price that is agreed upon today.
- ▶ However, unlike a forward contract, a futures contract is not a private transaction but gets traded on a recognized stock exchange.

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- Future contracts are organized/standardized contracts in terms of quantity, quality, delivery time and place for settlement on any date in future. These contracts are traded on exchanges.
 - These markets are very liquid
 - In these markets, clearing corporation/house becomes the counterparty to all the trades or provides the unconditional guarantee for the settlement of trades i.e. assumes the financial integrity of the whole system. In other words, we may say that the credit risk of the transactions is eliminated by the exchange through the clearing corporation/house.
 - The key elements of a futures contract are:
 - Futures price
 - Settlement or Delivery Date
 - Underlying (Infosys stock)

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- ▶ Let us once again take the earlier example where Jay and Viru entered into a contract to buy and sell Infosys shares.
 - ▶ Now, assume that this contract is taking place through the exchange, traded on the exchange and clearing corporation/house is the counter-party to this, it would be called a futures contract.

Example 1

- ▶ When you are dealing in March 2006 Futures Infosys the minimum market lot i.e. minimum quantity that you can buy and sell is 1000 shares of Infosys
- ▶ The contract would expire on 28th March 2006 The price is quoted per share the tick size is 50 paise per share $1500 \times .05 = \text{Rs } 75$ per contract/per market lot.
- ▶ The contract would be settled in cash and closing price in cash market on the expiry date would be the settlement price.

Example 2

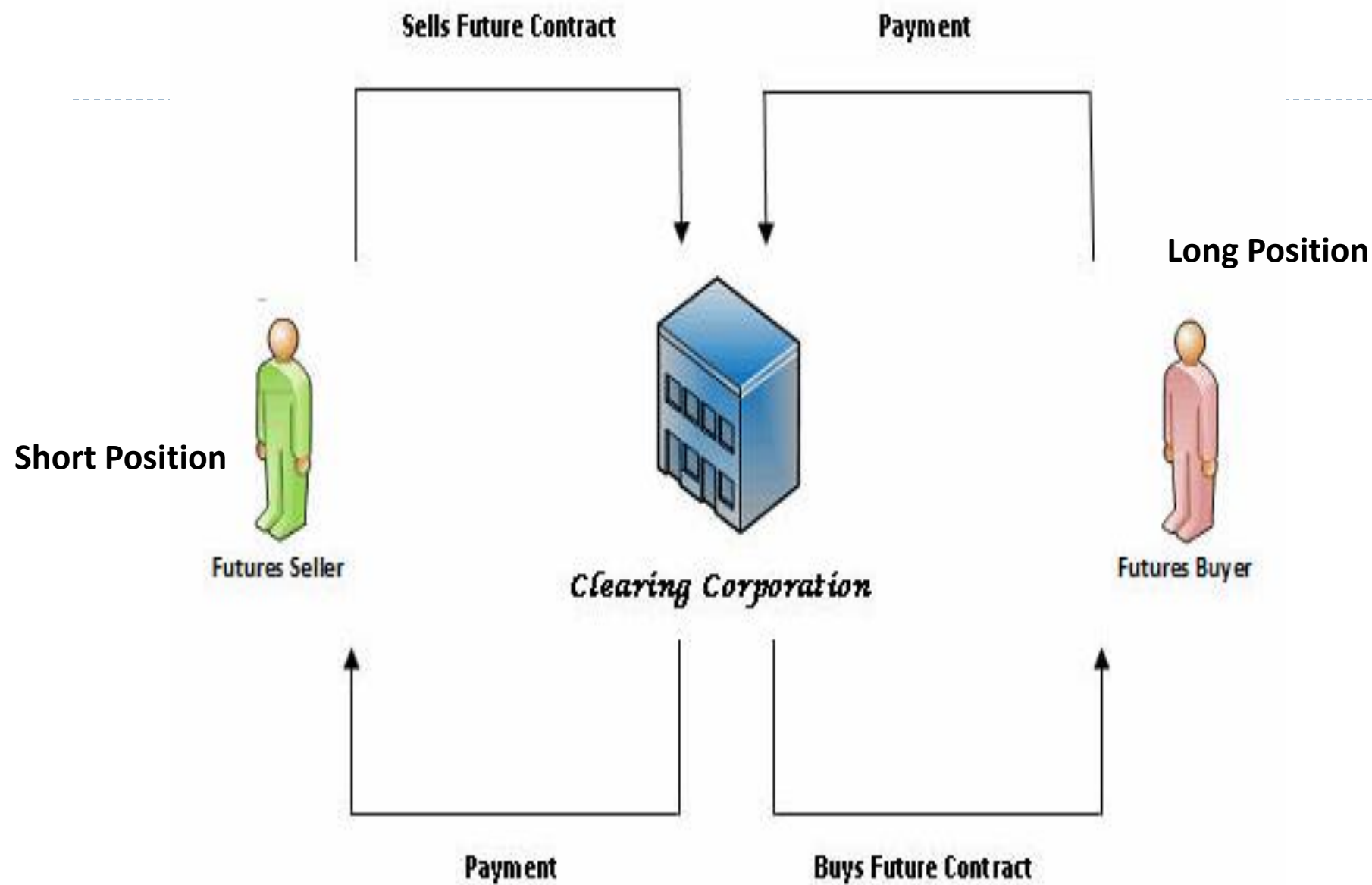
- ▶ On 1st September Mr. A enters into Futures contract to purchase 100 equity shares of X Ltd at an agreed price of Rs 100 in December.
- ▶ If on maturity date the price of equity stock rises to Rs120 Mr. A will receive Rs 20 per share and if the price of share falls to Rs 90 Mr. A will pay Rs 10 per share.
- ▶ As compared to forward contract the futures are settled only by the difference between the strike price and market price as on maturity date.

Positions in a futures contract

- ▶ **Long** - this is when a person buys a futures contract, and agrees to receive delivery at a future date. Eg: Viru's position
- ▶ **Short** - this is when a person sells a futures contract, and agrees to make delivery. Eg: Jay's Position

Structure of a futures contract:

- Seller (has *short position*) is obligated to deliver the commodity or a financial instrument to the buyer (has *long position*) on a specific date This date is called *settlement, or delivery, date*



Futures & Forwards Distinguished

FUTURES	FORWARDS
They trade on exchanges	Trade in OTC markets
Are standardized	Are customized
Identity of counterparties is irrelevant	Identity is relevant
Regulated	Not regulated
Marked to market	No marking to market
Easy to terminate	Difficult to terminate
Less costly	More costly

Options

- ▶ An **option is a derivative contract between a buyer and a seller, where one party (say First Party)** gives to the other (say Second Party) the right, but not the obligation, to buy from (or sell to) the First Party the underlying asset on or before a specific day at an agreed-upon price.
- ▶ The right to buy or sell is held by the “option buyer” (also called the option holder)
- ▶ The party granting the right is the “option seller” or “option writer”.

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- Unlike forwards and futures contracts, options require a cash payment (called the premium) upfront from the option buyer to the option seller. This payment is called option premium or option price.
 - Options can be traded either on the stock exchange or in over the counter (OTC) markets.
 - Options traded on the exchanges are backed by the Clearing Corporation thereby minimizing the risk arising due to default by the counter parties involved.

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- ▶ Each equity option gives the holder the right, but not the obligation to:
 - ▶ buy for a call option, or sell for a put option
 - ▶ X shares (standardized unit of trade)
 - ▶ of underlying stock
 - ▶ at the strike price (standardized)
 - ▶ at any time on or before (standardized)
 - ▶ its expiration date (standardized)

Rights

- ▶ What is the difference between a Right and an Obligation.
 - ▶ An Obligation is a **binding commitment** to perform.
 - ▶ A Right however, gives the **freedom to perform** if desired.
 - ▶ It need be exercised only if the holder wishes to do so.
 - ▶ In a transaction to trade an asset at a future date, **both parties cannot be given rights**.
 - ▶ For, if it is in the interest of one party to go through with the transaction when the time comes, it obviously will not be in the interest of the other.
 - ▶ Consequently while obligations can be imposed on both the parties to the contract, like in the case of a forward or a futures contract, a right can be given to only one of the two parties.
 - ▶ Hence, while a buyer of an option acquires a right, the seller has an obligation to perform imposed on him.

Two types of options

► Call options

- A call option is an option granting the *right to the buyer of the option to buy the underlying* asset on a specific day at an agreed upon price, *but not the obligation to do so*.
- It is the seller who grants this right to the buyer of the option. It may be noted that the person who has the **right to buy the underlying asset is known as the “buyer of the call option”**.
- the buyer of the call option has the right (but no obligation) to buy the underlying asset, he will exercise his right to buy the underlying asset if and only if the price of the underlying asset in the market is more than the strike price on or before the expiry date of the contract.

► **Put option**

- A put option is a contract granting the *right to the buyer of the option to sell the underlying asset* on or before a specific day at an agreed upon price, *but not the obligation to do so*.
- It is the seller who grants this right to the buyer of the option.
- The person who has the right to sell the underlying asset is known as the “buyer of the put option”.
- The price at which the buyer has the right to sell the asset is agreed upon at the time of entering the contract. This price is known as the strike price of the contract (put option strike price in this case).
- The buyer of the put option has the right (but not the obligation) to sell the underlying asset, he will exercise his right to sell the underlying asset if and only if the price of the underlying asset in the market is less than the strike price on or before the expiry date of the contract.
- The buyer of the put option does not have the obligation to sell if he does not want to.

► How to Identify an Option



Buying an Equity Call or Put

Call

An equity call option is a contract that gives its holder the right, but not the obligation, to buy 100 shares of underlying stock at the strike price per share at any time on or before its expiration date.

Call Contract

XYZ June 50 Call

The holder of this call contract has the right to buy 100 shares of XYZ stock at \$50.00 per share on or before its expiration date in June.

Put

An equity put option is a contract that gives its holder the right, but not the obligation, to sell 100 shares of underlying stock at the strike price per share at any time on or before its expiration date.

Put Contract

XYZ June 50 Put

The holder of this put contract has the right to sell 100 shares of XYZ stock at \$50.00 per share on or before its expiration date in June.

Writing an Equity Call

An equity call option is a contract which gives its writer the obligation to sell 100 shares of its underlying stock at the strike price per share at any time on or before its expiration date, if called upon to do so.



XYZ June 50 Call

The writer of this call contract has the obligation to sell 100 shares of XYZ stock at \$50.00 per share on or before its expiration date in June, if called upon to do so.

Writing an Equity Put

An equity put option is a contract which gives its writer the obligation to buy 100 shares of its underlying stock at the strike price per share at any time on or before its expiration date, if called upon to do so.

XYZ

June

50

Put

XYZ June 50 Put

The writer of this put contract has the obligation to buy 100 shares of XYZ stock at \$50.00 per share on or before its expiration date in June, if called upon to do so.

Illustration of Call Option

► Scenario 1 (Buy Call Option)

- Suppose A has “bought a call option” of 2000 shares of Hindustan Unilever Limited (HLL) at a strike price of Rs 260 per share at a premium of Rs 10.
- This option gives A, the buyer of the option, the right to buy 2000 shares of HLL from the seller of the option, on or before August 27, 2009 (expiry date of the option).
- The seller of the option has the obligation to sell 2000 shares of HLL at Rs 260 per share on or before August 27, 2009 (i.e. whenever asked by the buyer of the option).

► **Scenario 2 (Sell Call Option)**

- Suppose instead of buying a call, A has “sold a put option” on 100 Reliance Industries (RIL) shares at a strike price of Rs 2000 at a premium of Rs 8.
- This option is an obligation to A to buy 100 shares of Reliance Industries (RIL) at a price of Rs 2000 per share on or before August 27 (expiry date of the option) i.e., as and when asked by the buyer of the put option.
- It depends on the option buyer as to when he exercises the option. As stated earlier, the buyer does not have the obligation to exercise the option.

Terminology of Derivatives

- ▶ **Spot price (ST)**

- ▶ Spot price of an underlying asset is the price that is quoted for immediate delivery of the asset.
- ▶ For example, at the NSE, the spot price of Reliance Ltd. at any given time is the price at which Reliance Ltd.

- **Forward price or futures price (F)**

- ▶ Forward price or futures price is the price that is agreed upon at the date of the contract for the delivery of an asset at a specific future date. These prices are dependent on the spot price, the prevailing interest rate and the expiry date of the contract.

- **Strike price (K)**

- ▶ The price at which the buyer of an option can buy the stock (in the case of a call option) or sell the stock (in the case of a put option) on or before the expiry date of option contracts is called strike price.

- **Expiration date (T)**

- ▶ In the case of Futures, Forwards, Index and Stock Options, Expiration Date is the date on which settlement takes place. It is also called the final settlement date.

▶ **Contract size**

- ▶ As futures and options are standardized contracts traded on an exchange, they have a fixed contract size.
- ▶ One contract of a derivatives instrument represents a certain number of shares of the underlying asset.
- ▶ For example, if one contract of BHEL consists of 300 shares of BHEL, then if one buys one futures contract of BHEL

• **Contract Value**

- ▶ Contract value is notional value of the transaction in case one contract is bought or sold.
- ▶ It is the contract size multiplied by the price of the futures. Contract value is used to calculate margins etc. for contracts.
- ▶ In the example above if BHEL futures are trading at Rs. 2000 the contract value would be $\text{Rs. } 2000 \times 300 = \text{Rs. } 6 \text{ lacs}$.

BASIS

- ▶ Basis is defined as the difference between cash and futures prices:
$$\text{Basis} = \text{Cash prices} - \text{Future prices}.$$
- ▶ Basis can be either positive or negative (in Index futures, basis generally is negative).
- ▶ Basis may change its sign several times during the life of the contract.
- ▶ Basis turns to zero at maturity of the futures contract i.e. both cash and future prices converge at maturity

Types of options

Options can be divided into two different categories depending upon the primary exercise styles associated with options. These categories are:

- ▶ ***European Options:***

European options are options that can be exercised only on the expiration date.

- ▶ ***American options:***

American options are options that can be exercised on any day on or before the expiry date. They can be exercised by the buyer on any day on or before the final settlement date or the expiry date.

Margins

- ▶ This margin is a percentage (approximately 20%) of the total contract value. Thus, for the aforementioned example,
- ▶ If a person wants to buy 100 Infosys futures, then he will have to pay 20% of the contract value of Rs 2,00,000 = Rs 40,000 as a margin to the clearing corporation. This margin is applicable to both, the buyer and the seller of a futures contract.

Exercise An Option

- ▶ Exercising an option means to enforce your rights to buy the underlying stock if you are holding call options or to sell the underlying stock if you are holding put options.
- ▶ call options gives you the right to buy the underlying stock at a specific price while put options gives you the right to sell the underlying stock at a specific price but that right does not happen automatically prior to expiration of the option.
- ▶ That's right, options are what is known in finance as a "Contingent Claim", which means that a claim is contingent on the holder.
- ▶ The holder decides whether to enforce that right or not and that is known as to "exercise an option".

Moneyness of an Option

- ▶ “Moneyness” of an option indicates whether an option is worth exercising or not i.e. if the option is exercised by the buyer of the option whether he will receive money or not.
- ▶ “Moneyness” of an option at any given time depends on where the spot price of the underlying is at that point of time relative to the strike price.
- ▶ The premium paid is not taken into consideration while calculating moneyness of an Option, since the premium once paid is a sunk cost and the profitability from exercising the option does not depend on the size of the premium.
- ▶ Therefore, the decision (of the buyer of the option) whether to exercise the option or not is not affected by the size of the premium. The following three terms are used to define the moneyness of an option.

➤ **Equity call option:**

- In-the-money = strike price less than stock price
- At-the-money = strike price same as stock price
- Out-of-the-money = strike price greater than stock price

➤ **Equity put option:**

- In-the-money = strike price greater than stock price
- At-the-money = strike price same as stock price
- Out-of-the-money = strike price less than stock price

Applications of Derivatives

➤ **Participants in the Derivatives Market**

Based on the applications that derivatives are put to, these investors can be broadly classified into three groups:

- Hedgers
- Speculators, and
- Arbitrageurs

▶ **Hedgers**

- ▶ These investors have a position (i.e., have bought stocks) in the underlying market but are worried about a potential loss arising out of a change in the asset price in the future.
- ▶ Hedgers participate in the derivatives market to lock the prices at which they will be able to transact in the future.
- ▶ A hedger normally takes an opposite position in the derivatives market to what he has in the underlying market.
- ▶ Hedging in futures market can be done through two positions, viz. short hedge and long hedge.

▶ ***Short Hedge***

- ▶ A short hedge involves taking a short position in the futures market.
- ▶ Short hedge position is taken by someone who already owns the underlying asset or is expecting a future receipt of the underlying asset.
- ▶ For example, an investor holding Reliance shares may be worried about adverse future price movements and may want to hedge the price risk.
- ▶ He can do so by holding a short position in the derivatives market. The investor can go short in Reliance futures at the NSE. This protects him from price movements in Reliance stock. In case the price of Reliance shares falls, the investor will lose money in the shares but will make up for this loss by the gain made in Reliance Futures.

► ***Long Hedge***

- A long hedge involves holding a long position in the futures market.
- A Long position holder agrees to buy the underlying asset at the expiry date by paying the agreed futures/ forward price.
- This strategy is used by those who will need to acquire the underlying asset in the future.
- For example, a chocolate manufacturer who needs to acquire sugar in the future will be worried about any loss that may arise if the price of sugar increases in the future.
- To hedge against this risk, the chocolate manufacturer can hold a long position in the sugar futures.
- If the price of sugar rises, the chocolate manufacture may have to pay more to acquire sugar in the normal market, but he will be compensated against this loss through a profit that will arise in the futures market.

- ▶ Long hedge strategy can also be used by those investors who desire to purchase the underlying asset at a future date (that is, when he acquires the cash to purchase the asset) but wants to lock the prevailing price in the market.
- ▶ For example, suppose the current spot price of Wipro Ltd. is Rs. 250 per stock. An investor is expecting to have Rs. 250 at the end of the month. The investor feels that Wipro Ltd. is at a very attractive level and he may miss the opportunity to buy the stock if he waits till the end of the month. In such a case, he can buy Wipro Ltd. in the futures market.
- ▶ By doing so, he can lock in the price of the stock. Assuming that he buys Wipro Ltd. in the futures market at Rs. 250 (this becomes his locked-in

	Scenario I	Scenario II	Scenario III
Spot Price on expiry	300	250	200
Profit & Loss	50	0	-50
Net Buy Amount	250	250	250

▶ ***Speculators***

- ▶ A Speculator is one who bets on the derivatives market based on his views on the potential movement of the underlying stock price.
- ▶ Speculators take large, calculated risks as they trade based on anticipated future price movements.
- ▶ They hope to make quick, large gains; but may not always be successful. They normally have shorter holding time for their positions as compared to hedgers.

Illustration

- ▶ Currently ICICI Bank Ltd (ICICI) is trading at, say, Rs. 500 in the cash market and also at Rs. 500 in the futures market (assumed values for the example only).
- ▶ A speculator feels that post the RBI's policy announcement, the share price of ICICI will go up. The speculator can buy the stock in the spot market or in the derivatives market. If the derivatives contract size of ICICI is 1000 and if the speculator buys one futures contract of ICICI, he is buying ICICI futures worth $\text{Rs } 500 \times 1000 = \text{Rs. } 5,00,000$.
- ▶ For this he will have to pay a margin of say 20% of the contract value to the exchange.
- ▶ The margin that the speculator needs to pay to the exchange is 20% of $\text{Rs. } 5,00,000 = \text{Rs. } 1,00,000$.
- ▶ This Rs. 1,00,000 is his total investment for the futures contract.
- ▶ If the speculator would have invested Rs. 1,00,000 in the spot market, he could purchase only $1,00,000 / 500 = 200$ shares.

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- ▶ Let us assume that post RBI announcement price of ICICI share moves to Rs. 520. With one lakh investment each in the futures and the cash market, the profits would be:
 - ▶ · $(520 - 500) \times 1,000 = \text{Rs. } 20,000$ in case of futures market and
 - ▶ · $(520 - 500) \times 200 = \text{Rs. } 4000$ in the case of cash market.
 - ▶ It should be noted that the opposite will result in case of adverse movement in stock prices,
 - ▶ wherein the speculator will be losing more in the futures market than in the spot market

► **Arbitrageurs**

- Arbitrageurs attempt to profit from pricing inefficiencies in the market by making simultaneous trades that offset each other and capture a risk-free profit.
- An arbitrageur may also seek to make profit in case there is price discrepancy between the stock price in the cash and the derivatives markets.
- For example, if on 1st August, 2009 the SBI share is trading at Rs. 1780 in the cash market and the futures contract of SBI is trading at Rs. 1790,
- the arbitrageur would buy the SBI shares (i.e. make an investment of Rs. 1780) in the spot market and sell the same number of SBI futures contracts. On expiry day (say 24 August, 2009) the settlement of the futures contract will happen at the closing price of the SBI shares and that is why the futures and spot prices are said to converge on the expiry day.
- On expiry day, the arbitrageur will sell the SBI stock in the spot market and buy the futures contract, both of which will happen at the closing price of SBI in the spot market.

- Since the arbitrageur has entered into off-setting positions, he will be able

- There are three possible price scenarios at which SBI can close on expiry day. Let us calculate the profit/ loss of the arbitrageur in each of the scenarios where he had initially (1 August) purchased SBI shares in the spot market at Rs 1780 and sold the futures contract of SBI at Rs. 1790:

	Scenario I	Scenario II	Scenario III
SBI Closing Price on expiry	2000	1780	1500
Profit & Loss in Spot Market	220	0	-280
Profit & Loss in Future Market	-210	10	290
Net Profit & Loss	10	10	10

- Thus, in all three scenarios, the arbitrageur will make a profit of Rs. 10, which was the difference between the spot price of SBI and futures price of SBI, when the transaction was entered into. This is called a “risk less profit” since once the transaction is entered into on 1 August, 2009 (due to the price difference between spot and futures), the profit is locked.

-
- ▶ Irrespective of where the underlying share price closes on the expiry date of the contract, a profit of Rs. 10 is assured. The investment made by the arbitrageur is Rs. 1780 (when he buys SBI in the spot market). He makes this investment on 1 August 2009 and gets a return of Rs. 10 on this investment in 23 days (24 August). This means a return of 0.56% in 23 days. If we annualize this, it is a return of nearly 9% per annum.
 - ▶ The difference between the spot and futures price arose due to some inefficiency (in the market), which was exploited by the arbitrageur by buying shares in spot and selling futures. As more and more such arbitrage trades take place, the difference between spot and futures prices would narrow thereby reducing the attractiveness of further arbitrage.

Uses of Derivatives

- ▶ ***Risk management***
- ▶ ***Market efficiency***
- ▶ ***Price discovery***

► ***Risk management***

The most important purpose of the derivatives market is **risk management**.

Risk management for an investor comprises of the following three processes:

- Identifying the desired level of risk that the investor is willing to take on his investments;
- Identifying and measuring the actual level of risk that the investor is carrying; and Making arrangements which may include trading (buying/selling) of derivatives contracts that allow him to match the actual and desired levels of risk.

The example of hedging discussed above illustrates the process of risk management through futures.

► ***Market efficiency***

- Efficient markets are fair and competitive and do not allow an investor to make risk free profits.
- Derivatives assist in improving the efficiency of the markets, by providing a self-correcting mechanism.

▶ ***Price discovery***

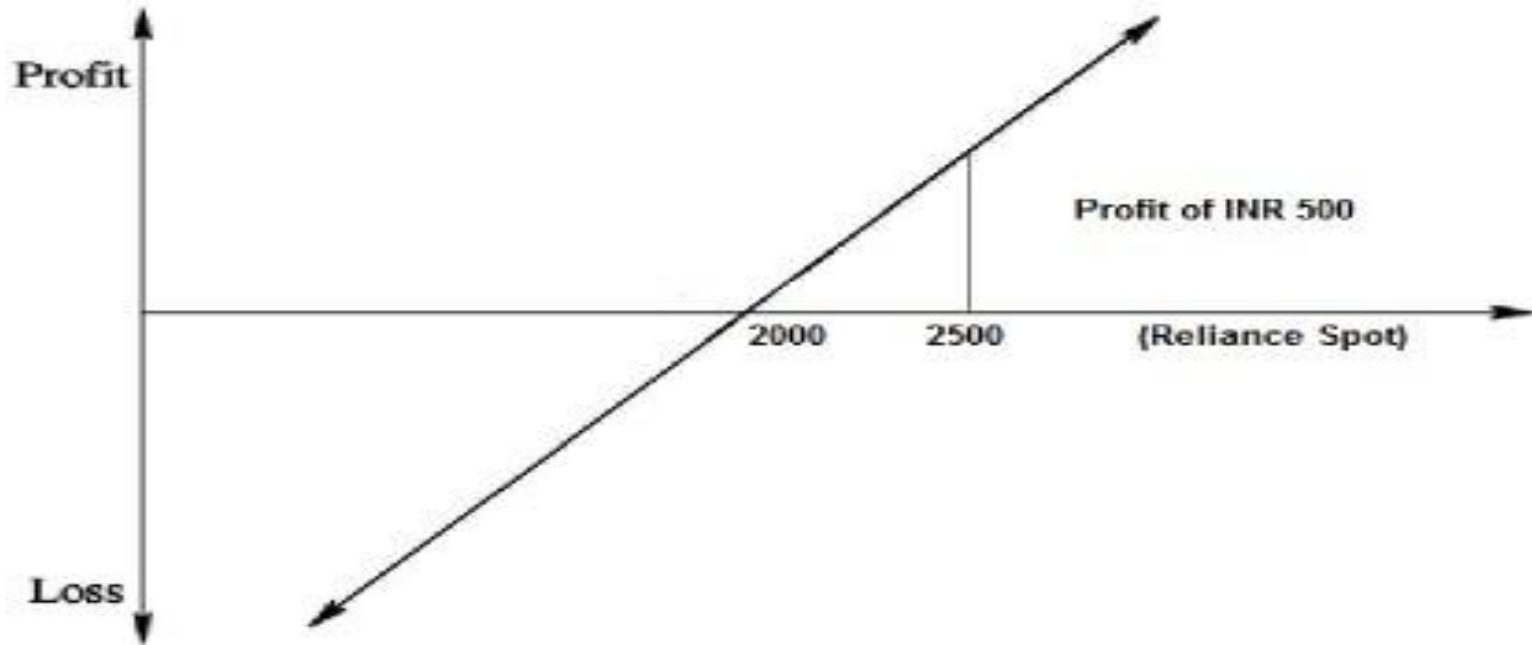
- ▶ One of the primary functions of derivatives markets is price discovery. They provide valuable information about the prices and expected price fluctuations of the underlying assets in two ways:
 - ▶ First, many of these assets are traded in markets in different geographical locations. Because of this, assets may be traded at different prices in different markets. In derivatives markets, the price of the contract often serves as a proxy for the price of the underlying asset. For example, gold may trade at different prices in Mumbai and Delhi but a derivatives contract on gold would have one value and so traders in Mumbai and Delhi can validate the prices of spot markets in their respective location to see if it is cheap or expensive and trade accordingly.
 - ▶ Second, the prices of the futures contracts serve as prices that can be used to get a sense of the market expectation of future prices. For example, say there is a company that produces sugar and expects that the production of sugar will take two months from today. As sugar prices fluctuate daily, the company does not know if after two months the price of sugar will be higher or lower than it is today.

Trading Futures

- ▶ To understand futures trading and profit/loss that can occur while trading, knowledge of pay-off diagrams is necessary. Pay-off refers to profit or loss in a trade.
- ▶ A pay-off is positive if the investor makes a profit and negative if he makes a loss.

Pay-Off Diagram

- ▶ A pay-off diagram represents profit/loss in the form of a graph which has the stock price on the X axis and the profit/ loss on the Y axis. Thus, from the graph an investor can calculate the profit or loss that his position can make for different stock price values.



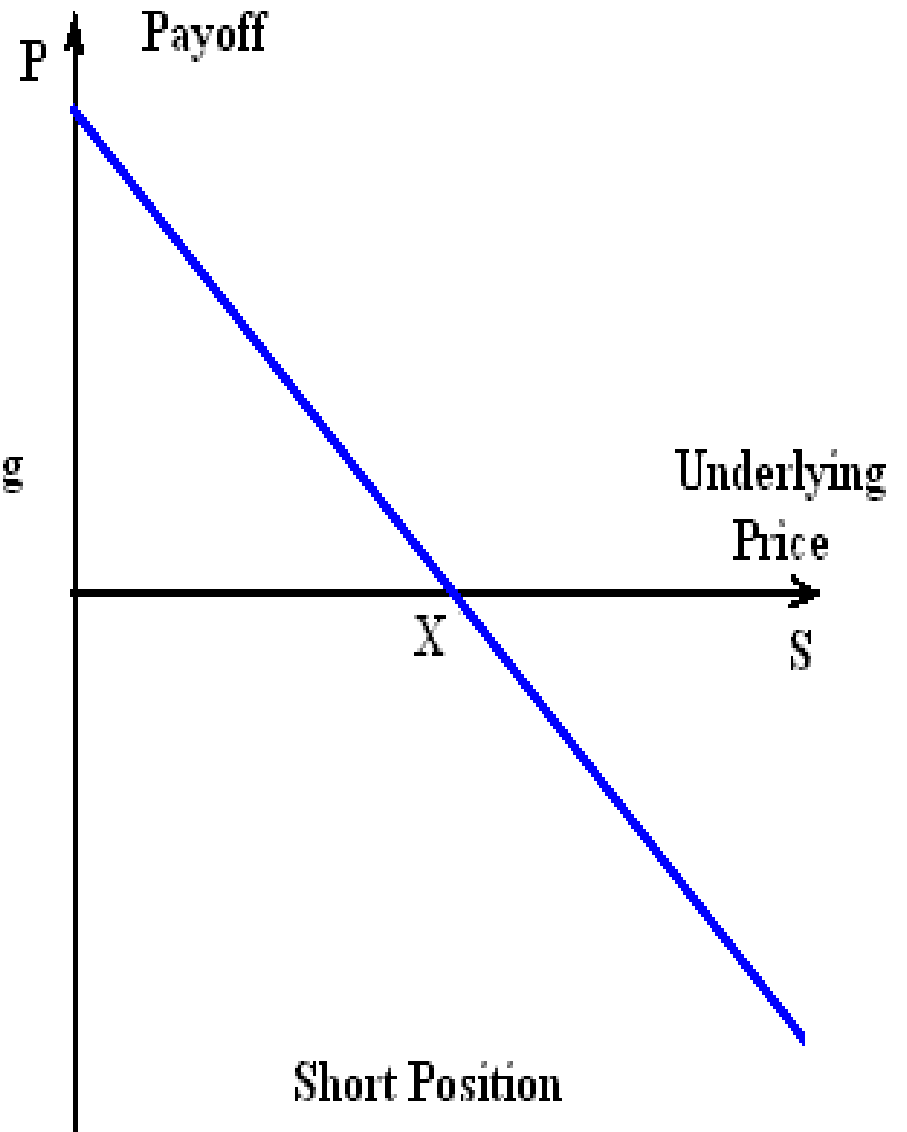
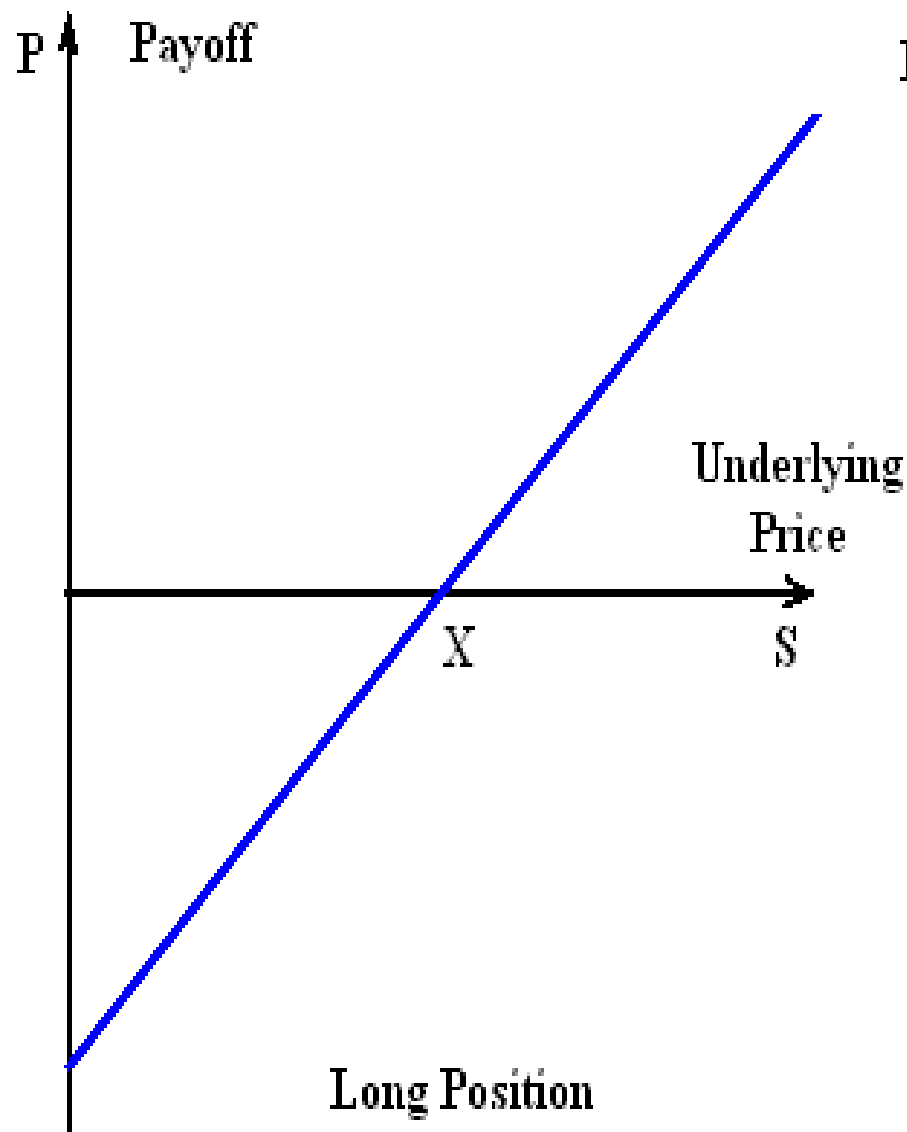
Pay-off of Futures

- ▶ There are two positions that could be taken in a futures contract:
 - ▶ a. Long position: one who buys the asset at the futures price (F) takes the long position and
 - ▶ b. Short position: one who sells the asset at the futures price (F) takes the short position

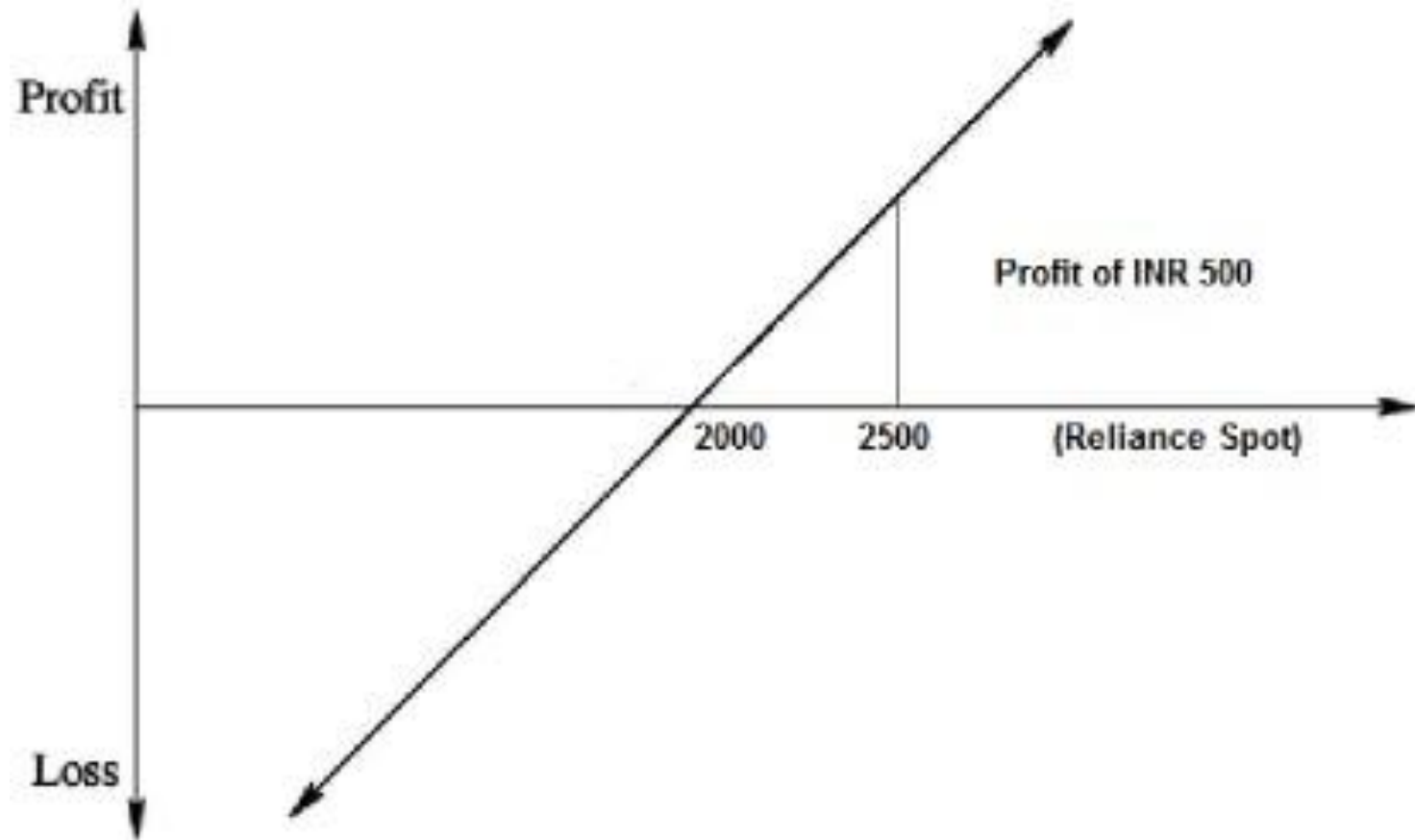
$$\text{Long Pay-off} = S_T - F$$

$$\text{Short Pay-off} = F - S_T$$

Where F is the traded futures price and S_T is the spot price of the asset at expiry of the contract (that is, closing price on the expiry date).



Long Pay-off



A theoretical model for Future pricing

- ▶ While futures prices in reality are determined by demand and supply, one can obtain a theoretical
- ▶ Futures price, using the following model:
- ▶ Where:
$$F = Se^{rT}$$
- ▶ F = Futures price
- ▶ S = Spot price of the underlying asset
- ▶ r = Cost of financing (using continuously compounded interest rate)
- ▶ T = Time till expiration in years
- ▶ $e = 2.71828$
- ▶ This model is also called the cost of carry model of pricing futures.
- ▶ Every time the market price for futures (which is determined by demand and supply) deviates from the fair value determined by using the above formula, arbitrageurs enter into trades to capture the arbitrage profit.

For example, if the market price of the Future is higher than the fair value, the arbitrageur would sell in the futures market and buy in the spot market simultaneously and hold both trades till expiry and book riskless profit.

Trading Options

▶ Option Payout

- ▶ There are two sides to every option contract. On the one side is the option buyer who has taken a long position (i.e., has bought the option).
- ▶ On the other side is the option seller who has taken a short position (i.e., has sold the option). The seller of the option receives a premium from the buyer of the option.

Elementary Investment Strategies

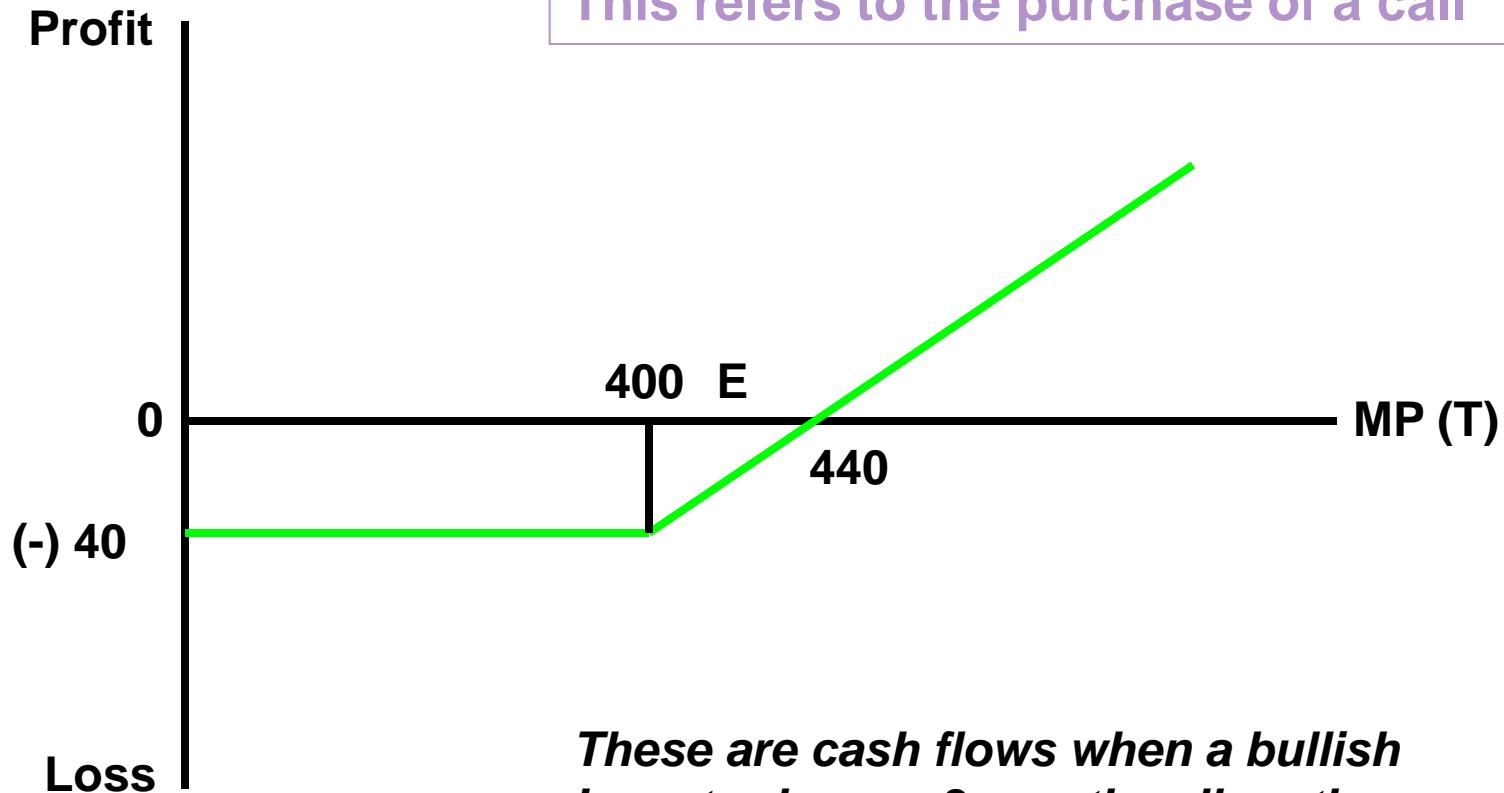
- ▶ **Long Call**
- ▶ **Short Call**
- ▶ **Long Put**
- ▶ **Short Put**

Long Call

- ▶ In this strategy, the investor has the **right to buy the asset in the future at a predetermined** strike price i.e., strike price (K) and the option seller has the obligation to sell the asset at the strike price (K).
- ▶ If the settlement price (underlying stock closing price) of the asset is above the strike price, then the call option buyer will exercise his option and buy the stock at the strike price (K).
- ▶ If the settlement price (underlying stock closing price) is lower than the strike price, the option buyer will not exercise the option as he can buy the same stock from the market at a price lower than the strike price.

Long Call

This refers to the purchase of a call



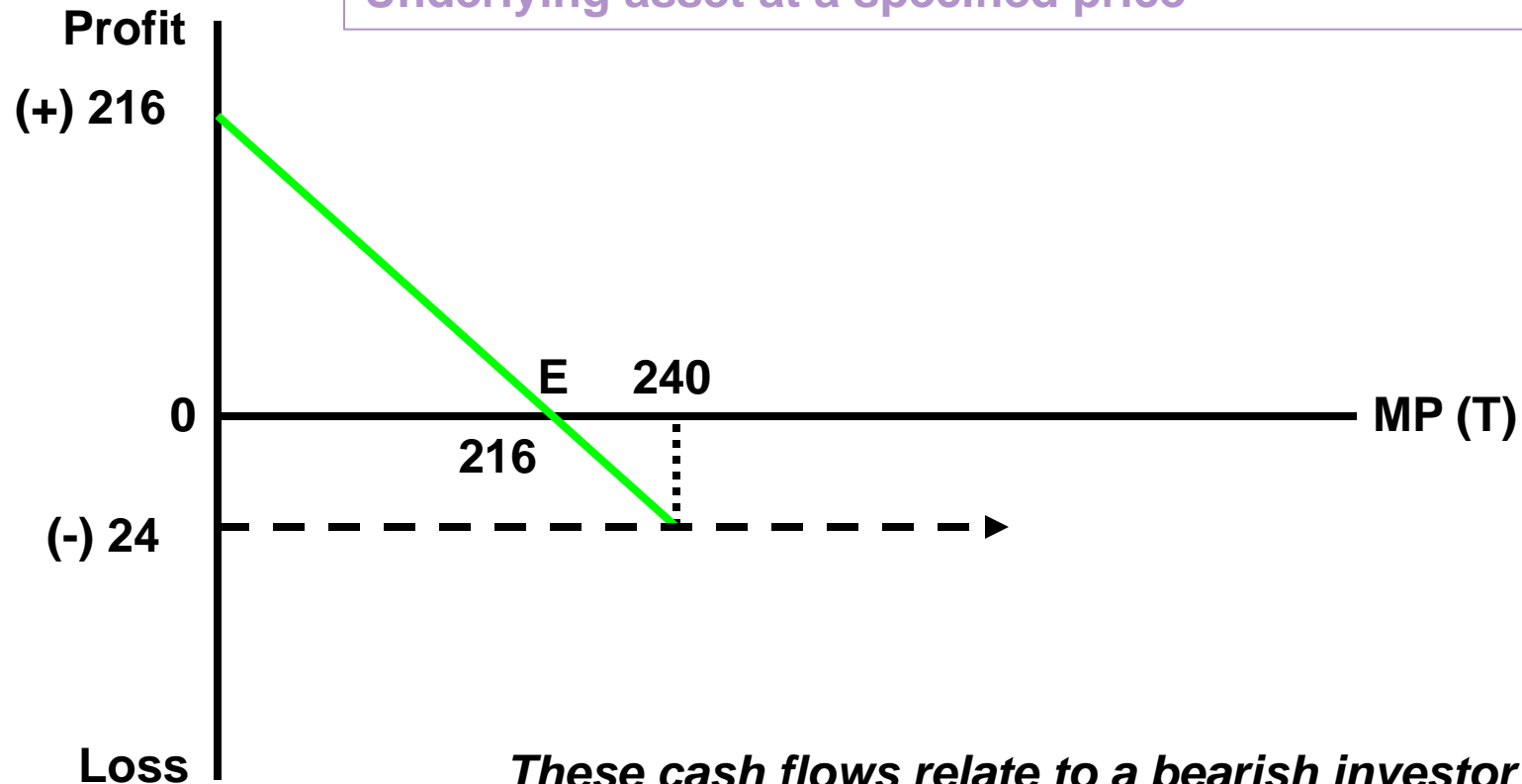
These are cash flows when a bullish Investor buys a 3-month call on the Stock with an exercise price of Rs.400 Per share by paying a premium of Rs.40

Long Put

- ▶ In this strategy, the investor has bought the **right to sell the underlying asset in the future at a** predetermined strike price (K).
- ▶ If the settlement price (underlying stock closing price) at maturity is lower than the strike price, then the put option holder will exercise his option and sell the stock at the strike price (K).
- ▶ If the settlement price (underlying stock closing price) is higher than the strike price, the option buyer will not exercise the option as he can sell the same stock in the market at a price higher than the strike price.

Long Put

This involves buying a put – the right to sell the Underlying asset at a specified price



*These cash flows relate to a bearish investor
Buying 3-month put with a exercise price of
Rs.240 per share by paying a premium of Rs.24*

Table 5.1: Explanation of pay-offs for long options

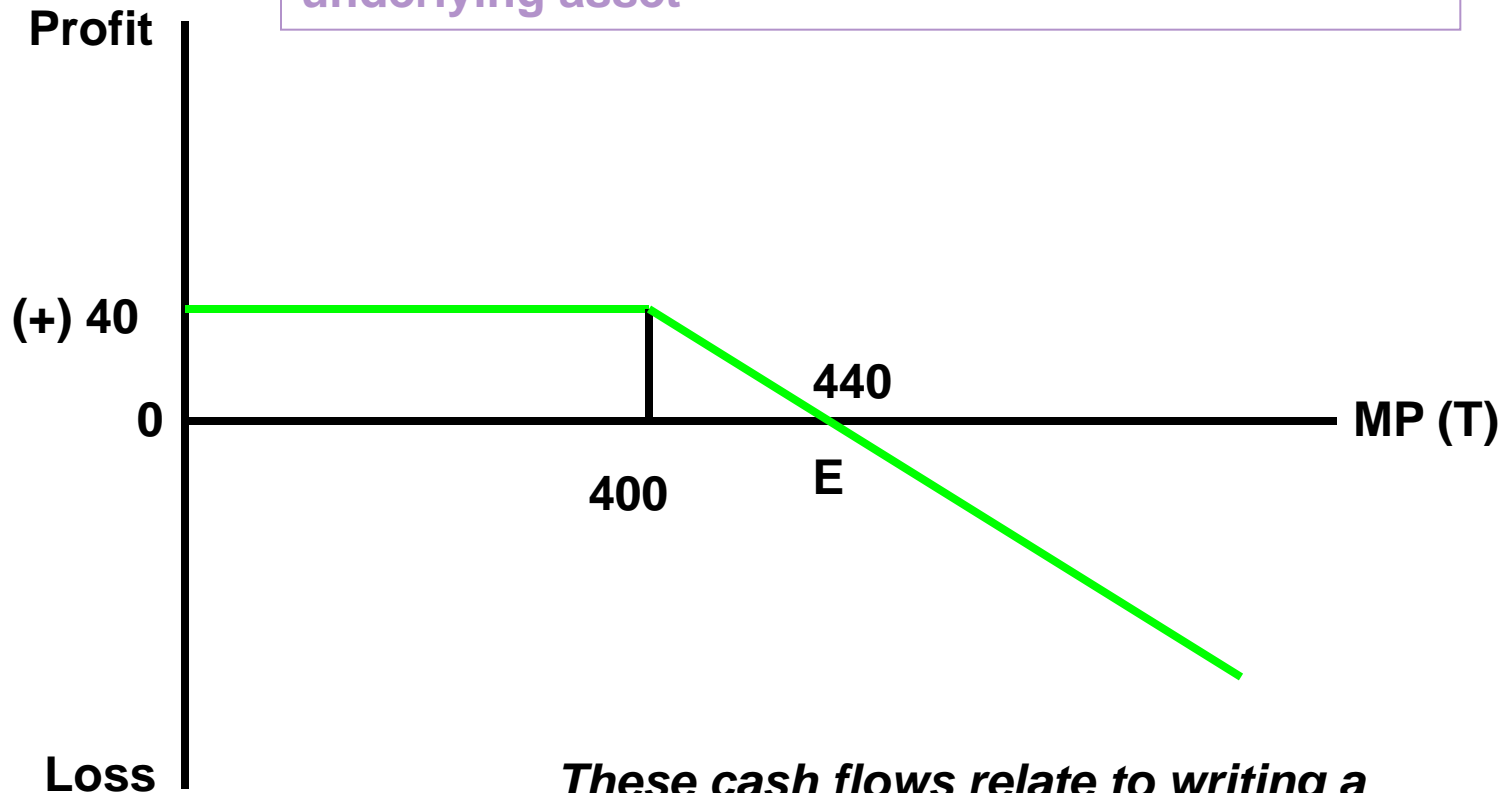
Option Position	Buyer's Pay-off	Explanation
Long Call Option	$\text{Max}(S_T - K, 0) - \text{Premium}$	If the closing spot price on any day on or before expiry is at a value above the strike price of the option, then the option buyer can make profit equal to the difference between the spot price and strike price; else he makes zero profit
Long Put Option	$\text{Max}(K - S_T, 0) - \text{Premium}$	If the closing spot price on any day on or before expiry is at a value lower than the strike price of the option, then the option buyer makes profit equal to the difference between the strike and spot price; else he make zero profit

Short Call

- ▶ In this strategy, the option seller has an **obligation to sell the asset at a predetermined strike** price (K) if the buyer of the option chooses to exercise the option.
- ▶ The buyer of the option will exercise the option if the spot price at maturity is any value higher than (K). If the spot price is lower than (K), the buyer of the option will not exercise his/her option.

Short Call

This involves writing a call without owning the underlying asset

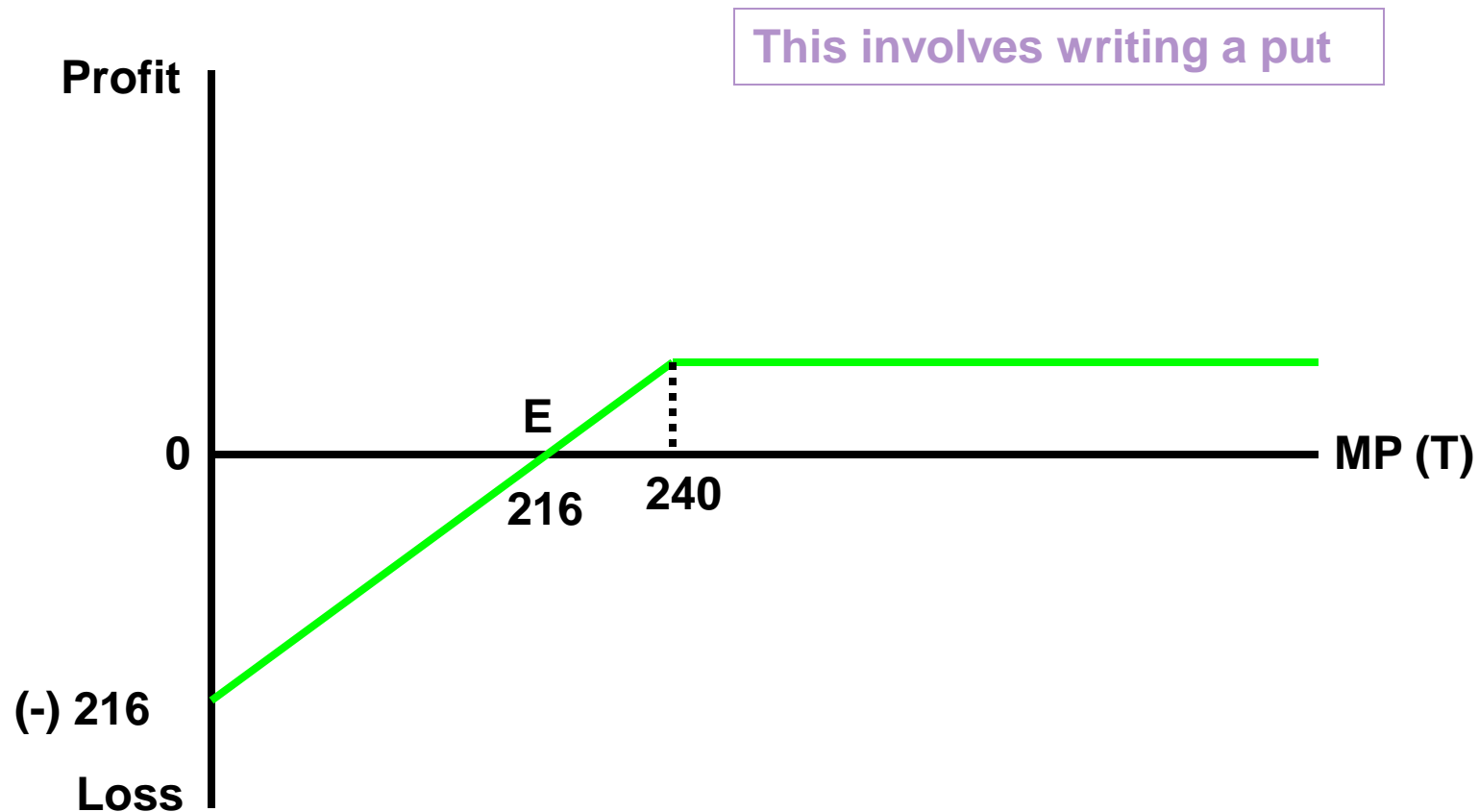


These cash flows relate to writing a 3-month call on a stock at an exercise price of Rs.400 per share by receiving a premium of Rs.40.

Short Put

- ▶ In this strategy, the option seller has an **obligation to sell the asset at a predetermined strike** price (K) if the buyer of the option chooses to exercise the option.
- ▶ The buyer of the option will exercise the option if the spot price at maturity is any value higher than (K). If the spot price is lower than (K), the buyer of the option will not exercise his/her option.

Short Put



*These cash flows relate to a bullish investor
Writing a put at an exercise price of Rs.240
Per share receiving a premium of Rs.24.*

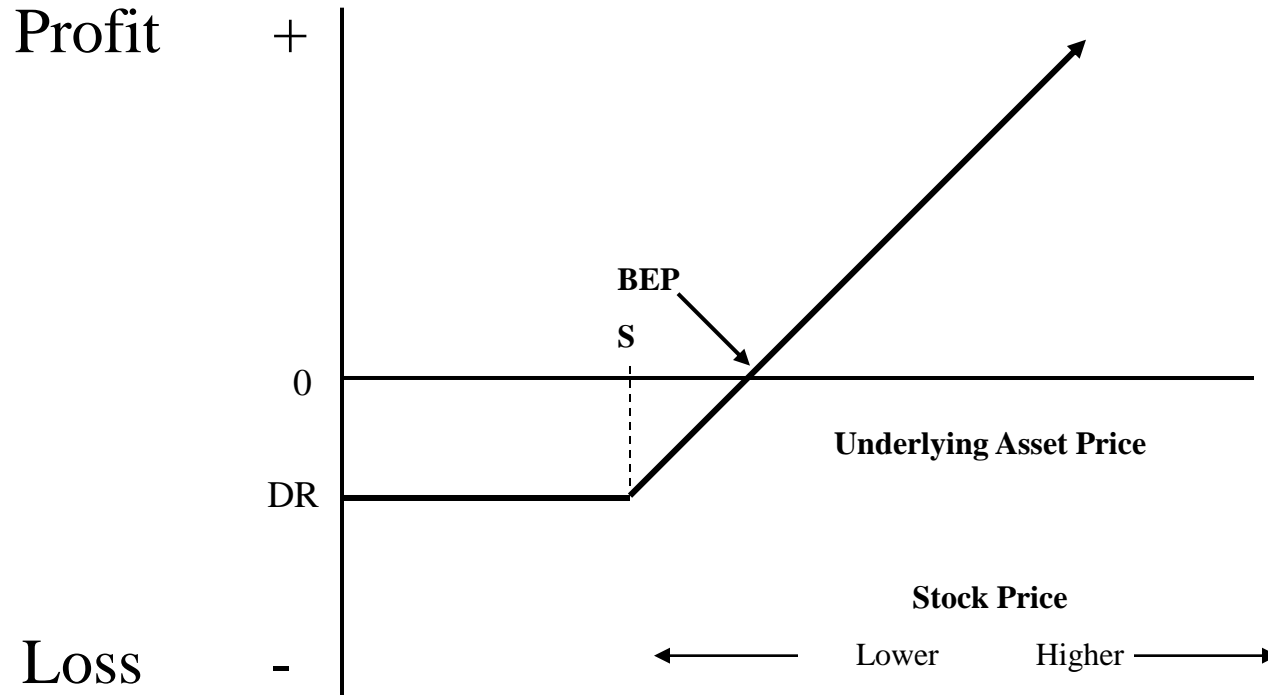
Option Strategies

LONG CALL

Market Opinion - Bullish

Most popular strategy with investors.

Used by investors because of better leveraging compared to buying the underlying stock – insurance against decline in the value of the underlying



Risk Reward Scenario

Maximum Loss = Limited (Premium Paid)

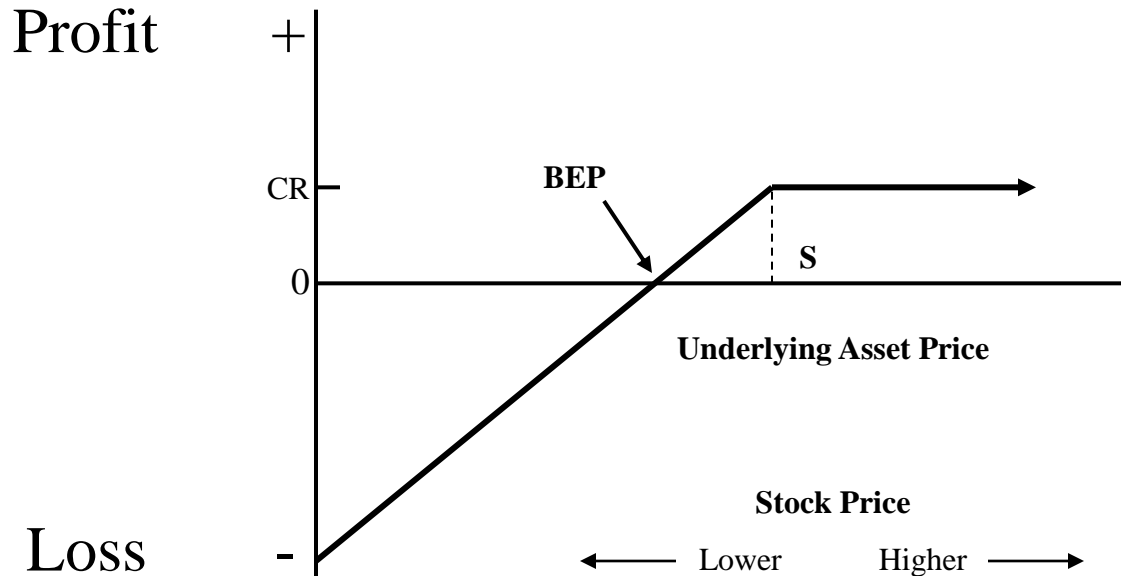
Maximum Profit = Unlimited

Profit at expiration = Stock Price at expiration – Strike Price – Premium paid

Break even point at Expiration = Strike Price + Premium paid

SHORT PUT

Market Opinion - Bullish



Risk Reward Scenario

Maximum Loss – Unlimited

Maximum Profit – Limited (to the extent of option premium)

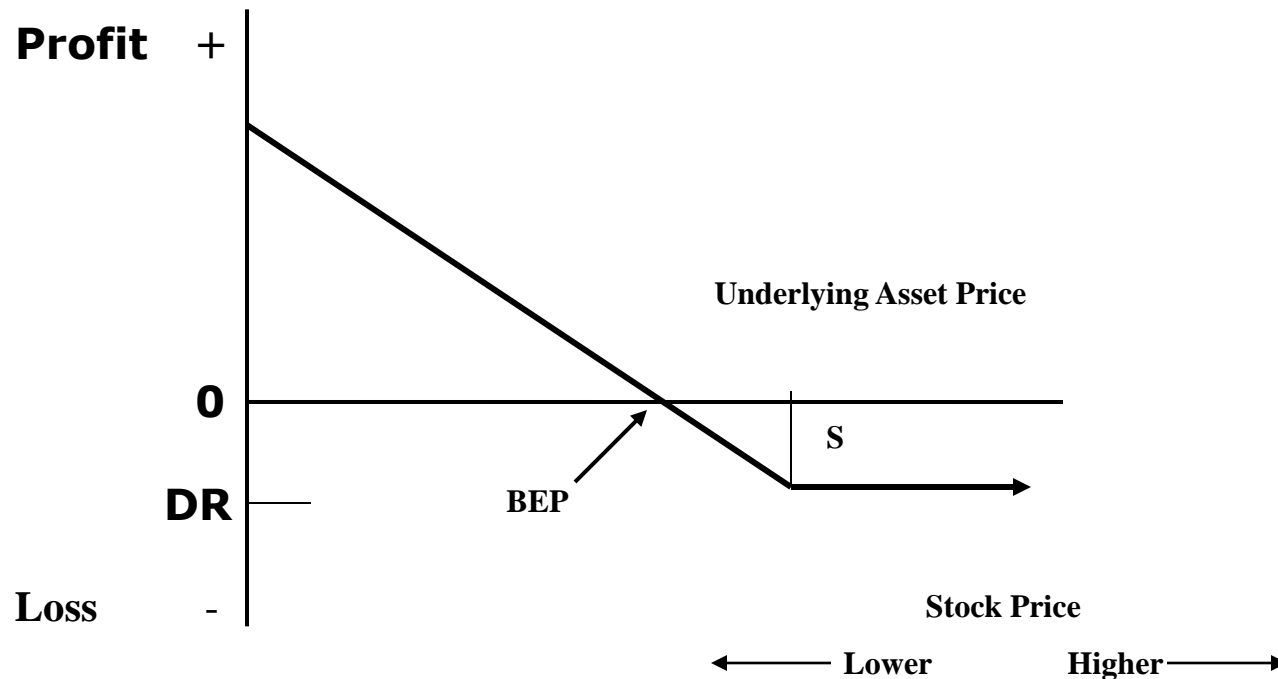
Makes profit if the Stock price at expiration > Strike price - premium

LONG PUT

Market Opinion – Bearish

For investors who want to make money from a downward price move in the underlying stock

Offers a leveraged alternative to a bearish or short sale of the underlying stock.



Risk Reward Scenario

Maximum Loss – Limited (Premium Paid)

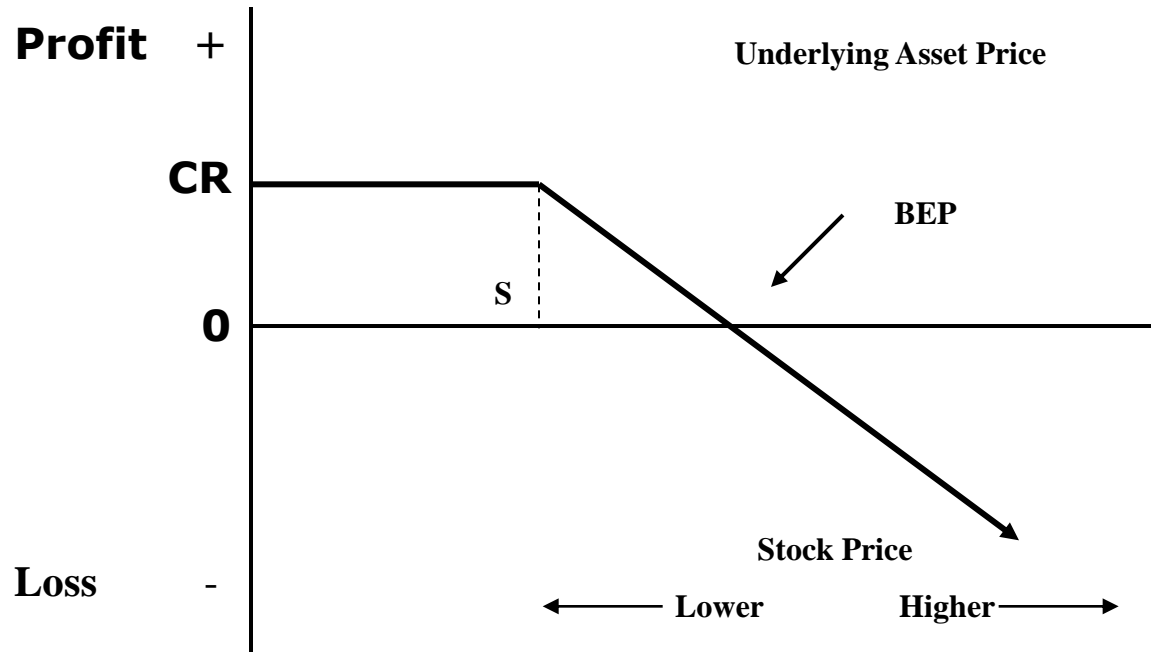
Maximum Profit - Limited to the extent of price of stock

Profit at expiration - Strike Price – Stock Price at expiration - Premium paid

Break even point at Expiration – Strike Price - Premium paid

SHORT CALL

Market Opinion – Bearish



Risk Reward Scenario

Maximum Loss – Unlimited

Maximum Profit - Limited (to the extent of option premium)

Makes profit if the Stock price at expiration < Strike price + premium

Intrinsic value and time value

► Intrinsic value of an option:

- Intrinsic value of an option at a given time is the amount the holder of the option will get if he exercises the option at that time.
- In other words, the intrinsic value of an option is the amount the option is in-the-money (ITM).
- If the option is out-of-the-money (OTM), its intrinsic value is zero. Putting it another way, the intrinsic value of a call is $\text{Max} [0, (S_t - K)]$ which means that the intrinsic value of a call is the greater of 0 or $(S_t - K)$.
- Similarly, the intrinsic value of a put is $\text{Max} [0, K - S_t]$ i.e., the greater of 0 or $(K - S_t)$ where K is the strike price and S_t is the spot price.

▶ **Time value of an option:**

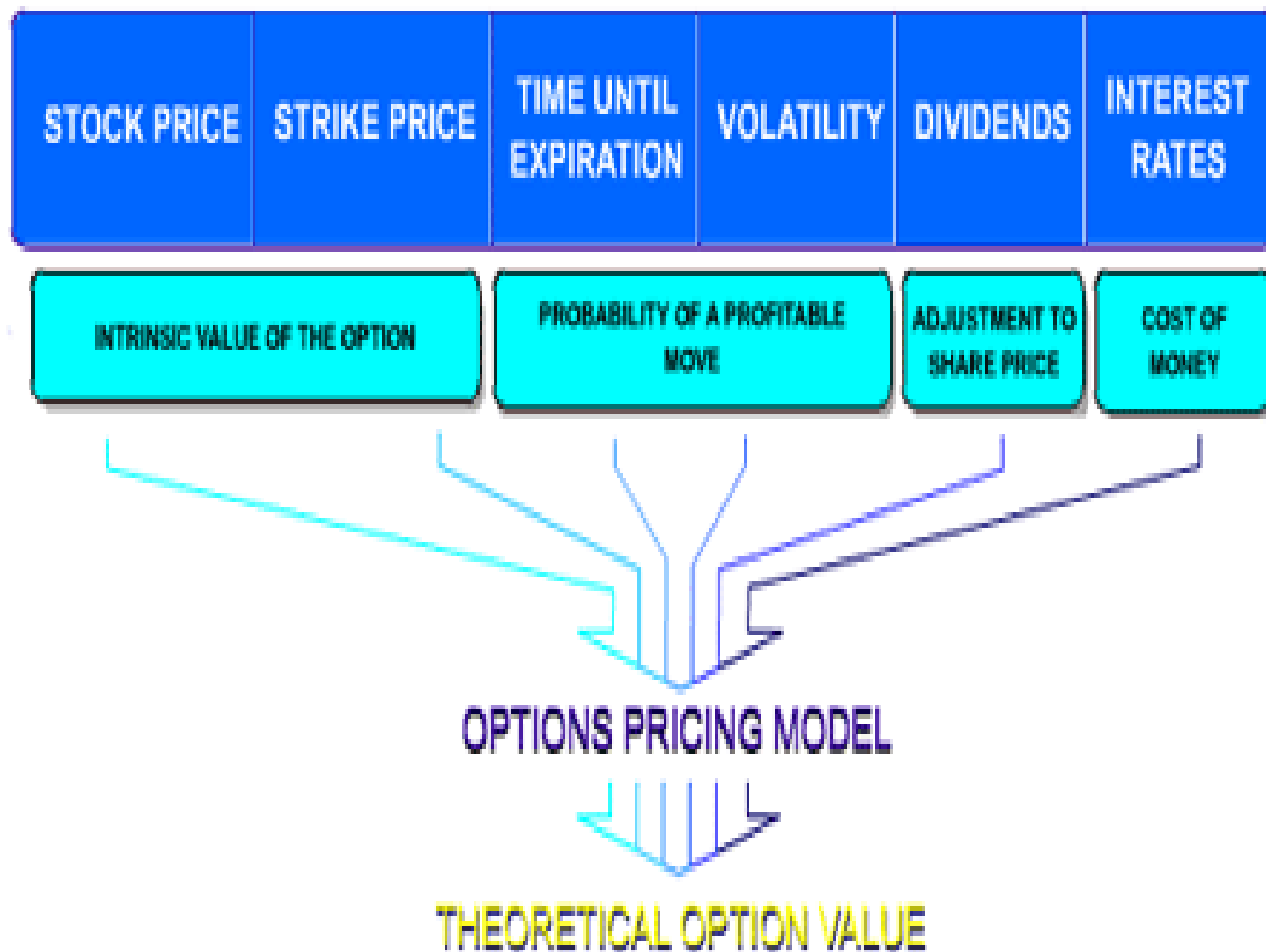
- ▶ In addition to the intrinsic value, the seller charges a 'time value' from the buyers of the option.
- ▶ This is because the more time there is for the contract to expire, the greater the chance that the exercise of the contract will become more profitable for the buyer.
- ▶ The time value of an option can be obtained by taking the difference between its premium and its intrinsic value. Both calls and puts have time value.
- ▶ An option that is Out-of-the-money (OTM) or At-the-money (ATM) has only time value and no intrinsic value.
- ▶ At expiration, an option has no time value.

Intrinsic and Time Value for Call Options: Examples				
Underlying	Strike Price	Premium	Intrinsic	Time
Price (Rs.)	(Rs.)	(Rs.)	Value	Value
			(Rs.)	(Rs.)
100	90	12	10	2
101	90	13	11	2
103	90	14	13	1
88	90	1	0	1
95	90	5.5	5	0.5

Intrinsic and Time Value for Put Options: Examples				
Underlying	Strike Price	Premium	Intrinsic	Time
Price (Rs.)	(Rs.)	(Rs.)	Value	Value
			(Rs.)	(Rs.)
100	110	12	10	2
99	110	13	11	2
97	110	14	13	1
112	110	1	0	1
105	110	5.5	5	0.5

Factors impacting option prices

- ▶ The supply and demand of options and hence their prices are influenced by the following factors:
 - ▶ The underlying price,
 - ▶ The strike price,
 - ▶ The time to expiration,
 - ▶ The underlying asset's volatility, and
 - ▶ Risk free rate
 - ▶ Dividend



► The underlying price:

- Call and Put options react differently to the movement in the underlying price.
- As the underlying price increases, intrinsic value of a call increases and intrinsic value of a put decreases.



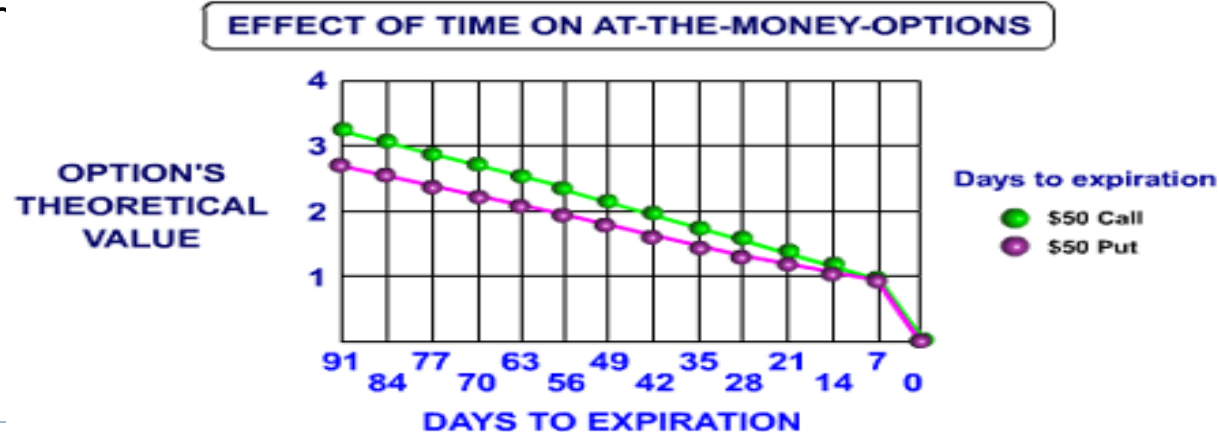
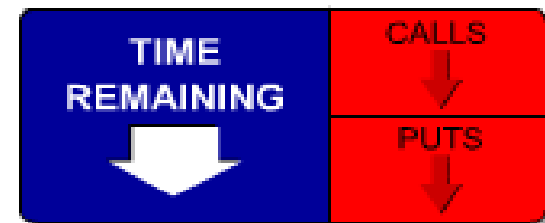
► The strike price:

- The strike price is specified in the option contract and does not change over
- time. The higher the strike price, the smaller is the intrinsic value of a call option and the
- greater is the intrinsic value of a put option.



► Time to expiration:

- Time to expiration is the time remaining for the option to expire.
- Obviously, the time remaining in an option's life moves constantly towards zero.
- Even if the underlying price is constant, the option price will still change since time reduces constantly and the time for which the risk is remain



► Volatility:

- Volatility is an important factor in the price of an option. Volatility is defined as the uncertainty of returns.
- The more volatile the underlying higher is the price of the option on the underlying. Whether we are discussing a call or a put, this relationship remains the same.



► Risk free rate:

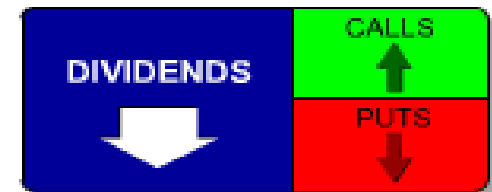
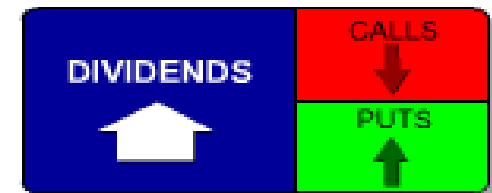
- Risk free rate of return is the theoretical rate of return of an investment which has no risk (zero risk). Government securities are considered to be risk free since their return is assured by the Government.
- Risk free rate is the amount of return which an investor is guaranteed to get over the life time of an option without taking any risk. As we increase the risk free rate the price of the call option increases marginally whereas the price of the put option decreases marginally.



- 98 It may however be noted that option prices do not change much with changes in the risk free rate.

► Dividends

- ▶ Regular cash dividends influence option premiums through their impact on the underlying stock price. On a stock's "ex-dividend date" the price of the stock paying the dividend will be lowered by the dividend amount when shares begin trading.
- ▶ All other pricing factors remaining constant, in general:
 - ▶ As an underlying stock's dividend increases, call prices decrease and put prices increase
 - ▶ As an underlying stock's dividend decreases, call prices increase and put prices decrease
- ▶ This is logical because of the fact that a decrease in underlying stock price will generally result in lower call prices and higher put prices. And all other factors remaining the same, the larger the dividend the greater its impact.



Derivatives Trading On Exchange

The F&O segment of NSE provides trading facilities for the following derivative instruments:

- Index based futures
- Index based options
- Individual stock options
- Individual stock futures

► ***Contract specifications for index based futures***

Underlying Index	S&P CNX Nifty
Exchange of trading Security Descriptor	National Stock Exchange of India Limited FUTIDX NIFTY
Contract Size	Permitted lot size is 50 (minimum value Rs 2 lakh)
Trading Cycle	The future contracts have a maximum of three month trading cycle - the near month (one), the next month (two), and the far month (three). New contracts are introduced on the next trading day following the expiry of the near month contract.
Expiry Day Settlement Basis	The last Thursday of the expiry month or the previous trading day if the last Thursday is a trading holiday Mark-to-market and final settlement are cash settled on T+1 basis
Settlement Price	Daily Settlement price is the closing price of the futures contracts for the trading day and the final settlement price is the value of the underlying index on the last trading day

Contract specifications for index based options

Underlying Index	S&P CNX Nifty
Security Descriptor	OPTIDX NIFTY
Contract Size	Permitted lot size is 50 (minimum value Rs. 2 lakh)
Trading Cycle	The Option contracts have a maximum of three month trading cycle--the near month (one), the next month (two), and the far month (three). New contracts are introduced on the next trading day following the expiry of the near month contract.
Expiry Day	The last Thursday of the expiry month or the previous trading day if the last Thursday is a trading holiday
Settlement Basis	Cash Settlement on T+1 basis
Style of Option	European
Daily Settlement	Not Applicable
Final Settlement price	Closing value of the index on the last trading day.

USING INDEX FUTURES

- ▶ **There are eight basic modes of trading on the index future market:**

Hedging

1. Long security, short Nifty Futures
2. Short security, long Nifty futures
3. Have portfolio, short Nifty futures
4. Have funds, long Nifty futures

Speculation

1. Bullish Index, long Nifty futures
2. Bearish Index, short Nifty futures

Arbitrage

1. Have funds, lend them to the market
2. Have securities, lend them to the market

Contract specifications for stock based futures

Underlying Exchange of Trading	Individual Securities NSE
Security Descriptor	FUTSTK
Contract Size	As specified by the exchange (minimum value of Rs. 2 lakh)
Trading Cycle	The futures contracts have a maximum of three month trading cycle---the near month (one), the next month (two), and the far month (three). New contracts are introduced on the next trading day following the expiry of the near month contract
Expiry Day	The last Thursday of the expiry month or the previous day if Thursday is a trading holiday
Settlement Basis	Mark to market and final settlement is cash settled on T+1 basis
Settlement Price	Daily settlement price is the closing price of the futures contracts for the trading day and the final settlement price is the closing price of the underlying security on the last trading day.

Contract specifications for stock based options

Underlying	Individual Securities available for trading in cash market
Security Descriptor	OPTSTK
Style of Option Contract size	European As specified by the exchange (minimum value of Rs 2 lakh)
Trading Cycle	The options contracts have a maximum of three month trading cycle—the near month (one), the next month (two), and the far month (three). New contracts are introduced on the next trading day following the expiry of near month contract
Expiry Day	The last Thursday of the expiry month or the previous trading day if the last Thursday is a trading holiday
Settlement Basis	Daily Settlement on T+1 basis and final option exercise settlement on T+1 basis
Daily Settlement	Premium value (net)
Final Settlement price	Closing price of underlying on exercise day or on expiry day

Index Option

Equity Derivatives Watch

All prices in ₹

View :

[Option Chain](#) | [Trade Statistics](#)

As on Mar 09, 2012 09:53:50 IST 

Instrument Type	Underlying	Expiry Date	Option Type	Strike Price	Open Price	High Price	Low Price	Prev Close	Last Price	Volume (Contracts)	Turnover (lacs.)	Underlying Value
Index Futures	NIFTY	29MAR2012	-	-	5,318.00	5,350.00	5,311.65	5,258.70	5,339.00	77,043	2,05,593.48	5,310.55
Index Options	NIFTY	29MAR2012	CE	5,400.00	75.65	98.70	75.65	69.40	94.90	55,241	1,51,750.34	5,310.55
Index Options	NIFTY	29MAR2012	PE	5,200.00	99.00	99.00	70.80	106.05	73.60	53,998	1,42,398.13	5,310.55
Index Options	NIFTY	29MAR2012	CE	5,500.00	45.00	60.00	45.00	41.05	57.00	45,845	1,27,377.58	5,310.55
Index Options	NIFTY	29MAR2012	PE	5,300.00	139.80	139.80	105.00	151.75	109.30	40,398	1,09,282.65	5,310.55
Index Options	NIFTY	29MAR2012	CE	5,300.00	121.55	151.75	121.55	110.30	146.65	39,116	1,06,498.59	5,310.55
Index Options	NIFTY	29MAR2012	PE	5,100.00	62.45	62.45	45.35	70.80	48.35	35,501	91,384.54	5,310.55



Stock Option

Instrument Type	Underlying	Expiry Date	Option Type	Strike Price	Open Price	High Price	Low Price	Prev Close	Last Price	Volume (Contracts)	Turnover (lacs.)	Underlying Value
Stock Options	SBIN	29MAR2012	CE	2,300.00	45.25	59.00	40.55	54.15	52.00	3,259	9,568.99	2,151.00
Stock Options	SBIN	29MAR2012	CE	2,200.00	78.60	97.00	68.00	88.30	89.40	3,100	8,844.46	2,151.00
Stock Options	SBIN	29MAR2012	CE	2,400.00	30.00	35.95	23.10	31.55	29.90	2,394	7,264.92	2,151.00
Stock Options	RELIANCE	29MAR2012	CE	820.00	14.00	14.10	8.00	14.75	10.40	3,184	6,615.40	764.00
Stock Options	SBIN	29MAR2012	PE	2,100.00	90.00	92.70	69.55	74.05	70.50	2,353	6,416.95	2,151.00
Stock Options	RELIANCE	29MAR2012	CE	800.00	17.30	21.85	12.00	21.80	15.35	2,971	6,060.77	764.00
Stock Options	TATAMOTORS	29MAR2012	CE	280.00	6.00	7.60	5.40	6.60	6.80	1,042	5,971.91	267.10
Stock Options	RPOWER	29MAR2012	CE	130.00	6.60	11.50	5.30	6.55	10.50	1,027	5,669.86	133.05

Open Interest (OI)

- ▶ Open interest is the total number of options and/or futures contracts that are not closed out on a particular day, that is contracts that have been purchased and are still outstanding and not been sold and *vice versa*.
- ▶ A common misconception is that open interest is the same thing as volume of options and futures trades.

Instrument Type:
Index Futures

Symbol :
NIFTY

Expiry Date :
29MAR2012

Option Type :
Select

Strike Price :
-

Go

5,341.50	Pr. Close	Open	High	Low	Close
▲ 82.80 1.57%	5,258.70	5,318.00	5,350.00	5,311.65	-

Fundamentals

Historical Data

[Print](#)

Traded Volume (contracts)	80,706
Traded Value (lacs)	2,15,373.65
VWAP	5,337.24
Underlying value	5,315.85
Market Lot	50
Open Interest	2,57,17,650
Change in Open Interest	8,14,850
Implied Volatility	-

Order Book		Intra-day	
Buy Qty.	Buy Price	Sell Price	Sell Qty.
500	5,340.95	5,341.50	550
50	5,340.60	5,341.65	450
50	5,340.55	5,342.00	100
50	5,340.40	5,342.60	50
100	5,340.10	5,342.65	100
6,22,800	Total Quantity		12,90,850

Instrument Type:	Symbol :	Expiry Date :	Option Type :	Strike Price :	Go
Stock Futures ▼	SBIN ▼	29MAR2012 ▼	Select ▼	- ▼	

2,219.90

▲ 58.65 2.71%

Pr. Close

2,161.25

Open

2,205.00

High

2,234.60

Low

2,200.75

Close

-

Fundamentals
Historical Data
[Print](#)

Traded Volume (contracts)	6,405
Traded Value (lacs)	17,785.00
VWAP	2,221.39
Underlying value	2,207.55
Market Lot	125
Open Interest	47,36,000
Change in Open Interest	27,000
Implied Volatility	-

Order Book
Intra-day
Future v/s Underlying
Future v/s Index

Buy Qty.	Buy Price	Sell Price	Sell Qty.
125	2,219.10	2,220.00	125
125	2,219.05	2,220.20	125
125	2,219.00	2,220.50	125
125	2,218.90	2,220.55	125
125	2,218.85	2,220.95	500
1,00,375	Total Quantity		1,30,375

☐ **Cost of Carry**

	Best Buy	Best Sell	Last Price
Price	2,219.10	2,220.00	2,219.90
Cost of Carry	9.52	10.26	10.18

Instrument Type:

Index Options

Symbol :

NIFTY

Expiry Date :

29MAR2012

Option Type :

Call

Strike Price :

5400.00

Go

98.05

▲ 28.65 41.28%

Pr. Close

69.40

Open

75.65

High

98.80

Low

75.65

Close

-

Fundamentals

Historical Data

[Print](#)

Traded Volume (contracts)	61,157
Traded Value (lacs)	168,008.06
VWAP	94.32
Underlying value	5,320.40
Market Lot	50
Open Interest	4,426,750
Change in Open Interest	94,550
Implied Volatility	24.03

Order Book

Intra-day

Buy Qty.	Buy Price	Sell Price	Sell Qty.
100	98.05	98.30	50
15,350	98.00	98.40	850
750	97.95	98.60	100
800	97.90	98.65	350
1,300	97.85	98.70	50
4,40,600	Total Quantity		2,20,450

[Other Information](#)

Instrument Type:	Symbol :	Expiry Date :	Option Type :	Strike Price :	Go
Stock Options ▼	SBIN ▼	29MAR2012 ▼	Call ▼	2300.00 ▼	

67.50	Pr. Close	Open	High	Low	Close
▲ 16.55 32.48%	50.95	63.00	74.00	63.00	-

Fundamentals

Historical Data

[Print](#)

Traded Volume (contracts)	777
Traded Value (lacs)	2,300.45
VWAP	68.55
Underlying value	2,205.50
Market Lot	125
Open Interest	261,875
Change in Open Interest	-4,750
Implied Volatility	45.58

Order Book

Intra-day

Buy Qty.	Buy Price	Sell Price	Sell Qty.
1,875	67.50	68.00	125
250	67.45	68.10	1,375
750	67.25	68.40	125
625	67.10	68.45	125
2,000	66.40	68.90	250
75,625	Total Quantity		31,000

Settlement of Derivatives

- ▶ Settlement refers to the process through which trades are cleared by the payment/receipt of currency, securities or cash flows on periodic payment dates and on the date of the final settlement.
- ▶ At the NSE, the National Securities Clearing Corporation Limited (NSCCL) undertakes the clearing and settlement of all trades executed on the F&O segment of NSE.
- ▶ It also acts as a legal counterparty to all trades on the F&O segment and guarantees their financial settlement.
- ▶ There are two clearing entities in the settlement process:

Clearing members

A Clearing member (CM) is the member of the clearing corporation i.e., NSCCL. These are the members who have the authority to clear the trades executed in the F&O segment in the exchange. There are three types of clearing members with different set of functions:

1) **Self-clearing Members: Members who clear and settle trades executed by them only**

on their own accounts or on account of their clients.

2) **Trading cum Clearing Members: They clear and settle their own trades as well as trades of other trading members (TM).**

3) **Professional Clearing Members (PCM): They only clear and settle trades of others** but do not trade themselves. PCMs are typically Financial Institutions or Banks who are admitted by the Clearing Corporation as members.

Clearing banks

- ▶ Some commercial banks have been designated by the NSCCL as Clearing Banks. Financial settlement can take place only through Clearing Banks. All the clearing members are required to open a separate bank account with an NSCCL designated

▶ 114 clearing bank for the F&O segment.

- ▶ The clearing members keep a margin amount in these bank accounts.

Settlement of Futures

- ▶ When two parties trade a futures contract, both have to deposit margin money which is called the initial margin.
- ▶ Futures contracts have two types of settlement:
 - ▶ (i) the mark-to-market (MTM) settlement which happens on a continuous basis at the end of each day, and
 - ▶ (ii) the final settlement which happens on the last trading day of the futures contract i.e., the last Thursday of the expiry month.

▶ ***Mark to market settlement***

- ▶ Mark to market settlement is the process of adjusting the margin balance in a futures account each day for the change in the value of the contract from the previous day, based on the daily settlement price of the futures contracts (Please refer to the Tables given below.).
- ▶ This process helps the clearing corporation in managing the counterparty risk of the future contracts by requiring the party incurring a loss due to adverse price movements to part with the loss amount on a daily basis.
- ▶ To ensure a fair mark-to-market process, the clearing corporation computes and declares the official price for determining daily gains and losses. This price is called the “settlement price” and represents the closing price of the futures contract.
- ▶ The closing price for any contract of any given day is the weighted average trading price of the contract in the last half hour of trading.

▶ Illustration of mark to market settlement

- ▶ To illustrate this concept, let us consider a futures contract that has been bought on the XYZ Ltd. at an initial price of Rs. 1000.
- ▶ The exchange sets two margins; Initial Margin and Maintenance Margin. Both parties to a derivative contract have to pay a certain Margin the moment they enter into the Contract; it is called Initial Margin.
- ▶ Maintenance margin is the level at which the margin has to be always maintained. In case the margin falls to maintenance margin or below, additional funds are called for to take have to take the margin to the Initial margin level.

- ▶ Let us say, Initial Futures Price = Rs. 1000; Initial Margin requirement = Rs. 500; Maintenance Margin Requirement = Rs. 300; Contract size = 10 (that is, one futures contract has 10 shares of XYZ).
- ▶ How the end of day margin balance of the holder of (i) a long position of a contract and (ii) a short position of a contract, varies with the changes in settlement price from day to day is given below.
- ▶ **Mark to market margin of a Long position**

Day	Beginning Balance	Funds Deposited	Settlement Price (Rs.)	Future Price Change	Gain/Loss (A) X Contract Size (Rs.)	Ending Balance
0	0	500	1000			
1	500	0	992	-8	-80	420
2	420	0	960	-32	-320	100
3	100	400	1010	50	500	1000
4	1000	0	1035	25	250	1250
5	1250	0	1030	-5	-50	1200
6	1200	0	1040	10	100	1300

Mark to market margin of a Short position

Day	Beginning	Funds	Settlement	Future	Gain/Loss	Ending
	Balance	Deposited	Price (Rs.)	Price Change	(A) X Contract Size (Rs.)	Balance
0	0	500	1000			
1	500	0	992	8	-80	580
2	580	0	960	32	320	900
3	900	0	1010	-50	-500	400
4	400	0	1035	-25	-250	150
5	150	350	1030	5	50	550
6	550	0	1040	-10	-100	450

Final settlement for futures

- ▶ After the close of trading hours on the expiry day of the futures contracts, NSCCL marks all positions of clearing members to the final settlement price and the resulting profit/loss is settled in cash.
- ▶ Final settlement loss is debited and final settlement profit is credited to the relevant clearing bank accounts on the day following the expiry date of the contract. Suppose the above contract closes on day 6 (that is, it expires) at a price of Rs. 1040, then on the day of expiry, Rs. 100 would be debited from the seller (short position holder) and would be transferred to the buyer (long position holder).

Settlement of Options

- ▶ In an options trade, the buyer of the option pays the option price or the option premium. The options seller has to deposit an initial margin with the clearing member as he is exposed to unlimited losses.
- ▶ There are basically two types of settlement in stock option contracts: daily premium settlement and final exercise settlement. Options being European style, they cannot be exercised before expiry.
- ▶ ***Daily premium settlement***
 - ▶ Buyer of an option is obligated to pay the premium towards the options purchased by him. Similarly, the seller of an option is entitled to receive the premium for the options sold by him.
 - ▶ The same person may sell some contracts and buy some contracts as well. The premium payable and the premium receivable are netted to compute the net premium payable or receivable for each client for each options contract at the time of settlement.

▶ **Exercise settlement**

- ▶ Stock and index options can be exercised only at the end of the contract.

▶ **Final Exercise Settlement**

- ▶ On the day of expiry, all in the money options are exercised by default. An investor who has a long position in an in-the-money option on the expiry date will receive the exercise settlement value which is the difference between the settlement price and the strike price.
- ▶ Similarly, an investor who has a short position in an in-the-money option will have to pay the exercise settlement value.
- ▶ The final exercise settlement value for each of the in the money options is calculated as follows:
 - **Call Options** = Closing price of the security on the day of expiry – strike price (if closing price > strike price, else 0)
 - **Put Options** = Strike price – closing price of the security on the day of expiry (if closing price < strike price, else 0)
 - Example: Suppose a call option on Reliance Industries has a Strike price of Rs. 2200, and the closing price is Rs. 2500 on the day of expiry, then the final exercise settlement value of the call option is: $V = 2500 - 2200 = 300$.

Accounting and Taxation of Derivatives

▶ ***Taxation of derivative instruments***

- ▶ Prior to the year 2005, the Income Tax Act did not have any specific provision regarding taxability of derivatives. The only tax provisions which had indirect bearing on derivatives transactions were sections 73(1) and 43(5). Under these sections, trade in derivatives was considered “speculative transactions” for the purpose of determining tax liability. All profits and losses were taxed under the speculative income category. Therefore, loss on derivatives transactions could be set off only against other speculative income and the same could not be set off against any other income. This resulted in high tax liability.
- ▶ Finance Act, 2005 has amended section 43(5) so as to exclude transactions in derivatives carried out in a “recognized stock exchange” from ‘speculative transaction’. This implies that derivatives transactions that take place in a “recognized stock exchange” are not taxed as speculative income or loss. They are treated under the business income head of the Income tax Act. Any losses on these activities can be set off against any business income in the year and the losses can be carried forward and set off against any other business income for the next eight years.

Equity derivatives clients

Institutional investors



Eg, portfolio managers. They are often benchmarked to a given index and generally need to protect themselves against adverse market moves.

Corporates



Treasury functions such as financing and stock options programs require equity derivatives solutions.

Retail / private banks and investors



Investors are attracted to customised structured products that are made up of derivative components.

Hedge funds



Generally take advantage of pricing anomalies that surface as a result 'natural' flows.

Mock Test

Q:1An investor is long 2 contracts of Nifty futures purchased at Rs. 5035 each. The next morning a scam is disclosed of a large company because of which markets sell off and Nifty futures goes down to Rs. 4855. What is the mark to market for the investor? (1 Nifty contract is 50 shares). [3 Marks]

- (a) Rs. -18000
- (b) Rs. 18000
- (c) Rs. -9000
- (d) Rs. 9000

Q:2If SBI is trading at Rs. Rs 2200 a share in the spot market and an investor wants to buy 200 SBI shares then he has to make a payment of _____. [2 Marks]

- (a) Depends on the initial margin of SBI
- (b) Rs. 2200
- (c) Rs. 4400
- (d) Rs. 440000

Q:3An investor buys a 4 lots of TATASTEEL futures at Rs. 545 each and sells it at Rs. 447 each. If one contract is 764 shares what is the Profit/ Loss in the transaction? [2 Marks]

- (a) Profit Rs. 74872
- (b) Loss 74872
- (c) Loss Rs. 299488
- (d) Profit Rs. 299488

Q:4What are the types of settlement (s) in forward contracts? [3 Marks]

- (a) Physical and Cash
- (b) Cash
- (c) Physical
- (d) There are no settlements for forward contracts

Q:5An investor sells 3 lots of Nifty futures at Rs. 5231 each. On that day Nifty closes at Rs 5310 in the futures market. What is the mark to market for the investor if any? One lot of Nifty is 50 shares [1 Mark]

- (a) Profit of Rs. 11000
- (b) Loss of Rs. 11850
- (c) Loss of Rs. 10000
- (d) Profit of Rs. 13000

Q:6In a business daily to get information about the top gainers in the futures market, one has to look in the heading : [2 Marks]

- (a) Contract details
- (b) Positive trend
- (c) Open Interest
- (d) Negative trend

Q:7 An investor bought a put option on a stock with a strike price Rs. 2000 for Rs. 200. The option will be in the money when _____. [1 Mark]

- (a) The stock price is less than Rs. 2000
- (b) The stock price is greater than Rs. 2200
- (c) The stock price is greater than Rs. 2000
- (d) The stock price is less than Rs. 1800

Q:8 All Stock Options are American in nature. [2 Marks]

- (a) TRUE
- (b) FALSE

Q:9 On 3rd August, NTPC is trading at Rs. 200 and 200 strike call option for one month is trading at Rs. 7.50. An investor who is bearish on NTPC sells the call option. NTPC on that month's expiry closes at Rs. 207.5. What is the investor's Profit / Loss in the trade? 1 lot of NTPC is 1625 shares. [2 Marks]

- (a) Rs. -12187
- (b) Rs. 10000
- (c) Rs. 12187
- (d) No Profit no Loss

Q:10 In futures trading initial margin is paid by : [3 Marks]

- (a) buyer only
- (b) clearing member
- (c) seller only
- (d) buyer and seller

Q:11 An investor has Unitech shares in her portfolio. RBI is increasing interest rates which is negative for the stock. She wants to protect the downside in the stock as she feels RBI will decide on increasing interest rates in the next 3 months. What should she do? [1 Mark]

- (a) Buy 3 month call option of Unitech
- (b) Buy 2 month put option of Unitech
- (c) Buy 1 month put option of Unitech
- (d) Buy 3 month put option of Unitech

Q:12 In India, all Options traded on a stock are : [1 Mark]

- (a) Continental Options
- (b) Asian Options
- (c) European options
- (d) American options

Q:13 SBI is trading at Rs. 1800 in the cash market. What would be the price of SBI futures expiring three months from today. Risk free rate = 8% p.a. [1 Mark]

- (a) 1844
- (b) 1895
- (c) 1814
- (d) 1836

Q:14 All December 2009 stock Futures contracts traded on NSE will expire on : [2 Marks]

- (a) Last Thursday of December 2009
- (b) Exchanges decides on expiry day and will update the investors on 1st December 2009
- (c) Last Friday of December 2009
- (d) 3rd Thursday of December 2009

Q:15 In India, all Options traded on Nifty are : [1 Mark]

- (a) Asian Options
- (b) American options
- (c) Continental Options
- (d) European options

Q:16 Nifty futures is trading at Rs. 3325 and an investor buys a 3400 call for current month for Rs. 100. What should be the closing price of Nifty only above which the investor starts to make Profits if he holds his long option position? 1 lot of Nifty = 50 shares. [2 Marks]

- (a) 3425
- (b) 3400
- (c) 3325
- (d) 3500

Q:17 Which of the following is an exchange traded contract? [3 Marks]

- (a) Futures on Nifty
- (b) Forward contract on oil
- (c) An interest rate swap
- (d) A 10 year loan

Q:18 As more and more _____ trades take place, the difference between spot and futures prices would narrow. [3 Marks]

- (a) hedge
- (b) delta
- (c) arbitrage
- (d) Speculative

Q:19 Nifty is at 5200. A put option at 5000 strike price is trading at Rs . 150. What is the intrinsic value of the option? [1 Mark]

- (a) 200
- (b) 0
- (c) 350
- (d) 150

Q:20 Nifty is currently at 5100. An investor feels Nifty will not go beyond 4500 in next three months. He sells two lots of 5100 strike call on Nifty for Rs.200 a lot. Because of good industrial production data, Nifty rallies to 5200 on the option's expiry day. What is the Profit/ Loss to the investor? (1 lot = 50 shares) [3 Marks]

- (a) Rs. 10000
- (b) Rs. -10000
- (c) Rs. 20000
- (d) Rs. -20000

Q:21 On 1st November, SBI is trading at Rs. 2300. An investor is bearish on the company because of the earnings of last quarter and sells a SBI futures at Rs. 2325. He buys back SBI futures at Rs. 2300. What is the Profit / Loss for the investor if 1 lot of SBI is 250 shares? [3 Marks]

- (a) Rs. 6250
- (b) Rs. 0
- (c) Rs. -6250

▶ (d) Rs. -10000

Q:22 Which of the following is NOT a hedge for a long position in an underlying stock? [2 Marks]

- (a) Sell call option
- (b) Sell futures
- (c) Sell put option
- (d) Buy Put option

Q:23 When the strike price is lower than the spot price of the underlying, a call option will be _____. [1 Mark]

- (a) At the money
- (b) In the money
- (c) Out of the money
- (d) American Type

Q:24 On 1st January, SBI is trading at Rs. 2310. An investor is bullish on the company because of the earnings of last quarter and buys a SBI futures at Rs. 2310. He sells SBI futures at Rs. 2335. What is the Profit / Loss for the investor if 1 lot of SBI is 250 shares? [2 Marks]

- (a) Rs. -10000
- (b) Rs. -6250
- (c) Rs. 6250
- (d) Rs. 0

Q:25 An investor buys TCS for Rs. 575 in the futures market. At the end of the day TCS futures closes at Rs. 500 in the futures market. What is the mark to market the investor is making/losing ? (1 lot of TCS = 1000 shares) [2 Marks]

- (a) Rs. 500000
- (b) Rs. 575000
- (c) Rs. -75000
- (d) Rs. 75000

Q:26 An investor buys a 4 lots of Nifty at Rs. 5100 each. He sells 2 lots at Rs. 5050 and carries 2 lots for next day. On that day Nifty futures closes at Rs. 5000. What is his total Loss including mark to market Loss? One lot of Nifty is 50 shares . [1 Mark]

- (a) Loss of Rs. 5000
- (b) Profit of Rs. 5000
- (c) Profit of Rs. 2000
- (d) No Loss, no Profit

Q:27 Infosys is trading at Rs. 1500 in the cash market. What should be the fair price of Infosys futures expiring 90 days from today. Risk free rate is 8% p.a. [3 Marks]

- (a) 1550
- (b) 1515
- (c) 1530
- (d) 1540

Q:28 An investor buys a 1 lot of Nifty futures at Rs. 4927 and sells it at Rs. 4567 If one contract is 50 shares what is the Profit/ Loss in the transaction? [2 Marks]

- (a) Loss Rs. 22000
- (b) Profit Rs. 22000
- (c) Loss Rs. 18000
- (d) Profit Rs. 18000

Q:29 Which of the following positions has a limited downside _____. [2 Marks]

- (a) Sell futures
- (b) Buy Call Option
- (c) Sell stock
- (d) Sell Call option

Q:30 Reliance is trading at Rs. 1520 in the cash market. What should be the fair price of Reliance futures expiring 90 days from today. Risk free rate is 8% p.a. [3 Marks]

- (a) 1529
- (b) 1537
- (c) 1551
- (d) 1563

Q:31 Like Futures contracts there is daily settlement of options contracts. [2 Marks]

- (a) TRUE
- (b) depends on the expiry
- (c) FALSE
- (d) depends if the option is call or put

Q:32 TCS is trading at Rs. 420 in the spot market and Rs. 435 in the futures market. Is there an arbitrage opportunity? The Futures contract is settling today. [1 Marks]

- (a) No
- (b) Depends on Market Sentiment
- (c) Yes

Q:33 Reliance Capital is trading at Rs. 1000 in cash market. What should be the price of Reliance capital futures expiring 60 days from today. Risk free rate is 8% p.a. [2 Marks]

- (a) 1087
- (b) 1013
- (c) 1081
- (d) 1121

Q:34 An investor buys 2 contracts of TCS futures for Rs. 570 each. He sells of one contract at Rs. 585. TCS futures closes the day at Rs. 550. What is the net payment the investor has to pay/ receive from his broker? 1 TCS contract = 1000 shares [2 Marks]

- (a) Pay Rs. 20000 to the broker
- (b) Pay Rs. 5000 to the broker
- (c) Receive Rs. 5000 from the broker
- (d) Receive Rs. 15000 from the broker

Q:35 The value of a put option is positively related to all of the following EXCEPT:[2 Marks]

- (a) exercise price
- (b) risk-free rate
- (c) time to maturity

Q:36 If a farmer expects to sell his wheat in three months time in anticipation of a harvest. He wants to hedge his risk, he needs to: [3 Marks]

- (a) buy wheat futures now
- (b) buy wheat now
- (c) sell wheat now
- (d) sell wheat futures now

Q:37 DLF is trading at Rs. 380 in the spot market and Rs. 395 in the futures market. Is there an arbitrage opportunity? The Futures contract is settling today.

[1 Mark]

- (a) Depends on Market Sentiment
- (b) Yes
- (c) No

Q:38 Security descriptor for stock Futures contract is : [2 Marks]

- (a) FUTSTK
- (b) OPTIDX
- (c) OPTSTK
- (d) FUTIDX

Q:39 Derivatives help in _____. [2 Marks]

- (a) Risk Management
- (b) Price Discovery of the underlying
- (c) Improving Market Efficiency
- (d) All of the above

Q:40 Nifty is at 3900. What should be the fair price of Nifty futures expiring 180 days from today. Risk free rate is 8% p.a. [3 Marks]

- (a) 4027
- (b) 4083
- (c) 4031
- (d) 4059

Q:41 The maximum expiry for individual stock options contract is : [2 Marks]

- (a) 2 months
- (b) 6 months
- (c) 1 months
- (d) 3 months

Q:42 The parties for the Futures contract have the flexibility of closing out the contract prior to the maturity by squaring off the transactions in the market. State true or false. [3 Marks]

- (a) TRUE
- (b) FALSE

Q:43 Nifty is at 3375. What should be the fair price of Nifty futures expiring 30 days from today. Risk free rate is 8% p.a. [2 Marks]

- (a) 3367
- (b) 3377
- (c) 3398
- (d) 3352

Q:44 Nifty futures is trading at Rs. 4955. An investor feels the market will not go beyond 5100. He can _____. [2 Marks]

- (a) Sell 5000 Nifty call
- (b) Sell 5100 Nifty put
- (c) Sell 5000 Nifty put
- (d) Sell 5100 Nifty Call

Q:45 Arbitrage is a _____. [2 Marks]

- (a) Risk free Strategy
- (b) High Risk Strategy

Q:46 If an option is out of the money and the strike price of the option is lower than the spot price of the underlying, then we are referring to _____. [1 Mark]

- (a) A Put Option
- (b) An European Option
- (c) A Call option
- (d) An American option

Q:47 Nifty is at 5000. An investor buys a 5000 strike price put option for Rs. 170. The option is currently_____. [1 Mark]

- (a) Out of the money
- (b) American Type
- (c) At the money
- (d) In the money

Q:48 Nifty futures is trading at Rs. 3975 and an investor buys a 4000 call for current month for Rs. 100. What should be the closing price of Nifty only above which the investor starts to make Profits if he holds his long option position? 1 lot of Nifty = 50 shares. [3 Marks]

- (a) 3975
- (b) 4000
- (c) 4075
- (d) 4100

Q:49 Price that is agreed upon at the date of the contract for the delivery of an asset at a specific futures date is called _____. [2 Marks]

- (a) Spot Price
- (b) Discount Price
- (c) Cash market price
- (d) Futures Price

Q:50 Price of an option expiring three months from today will be higher than price of an option expiring in two months from today. [2 Marks]

- (a) Incomplete data
- (b) Depends if it is call or put option

▶ (c) TRUE

- (d) FALSE

Thank You
&
All The Best

