CA FINAL
ADVANCED FINANCIAL MANAGEMENT

NEW SYLLABUS
VOLUME 02

COMPLETE COVERAGE OF ICAI MATERIAL AS PER NEW SYLLABUS, RTP, MTP & PAST PAPERS

SPECIAL CHAPTER SUMMARY WITH FORMULAS

400+ PRACTICAL BASED SOLVED NUMERICAL QUESTIONS WITH SOLUTIONS

EXHAUSTIVE COVERAGE OF ALL CONCEPTS WITH EXAMPLES

CA SANKALP KANSTIYA
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SCAN & GET FREE VIDEOS

SUBJECT INDEX

Company

Long Term Vision
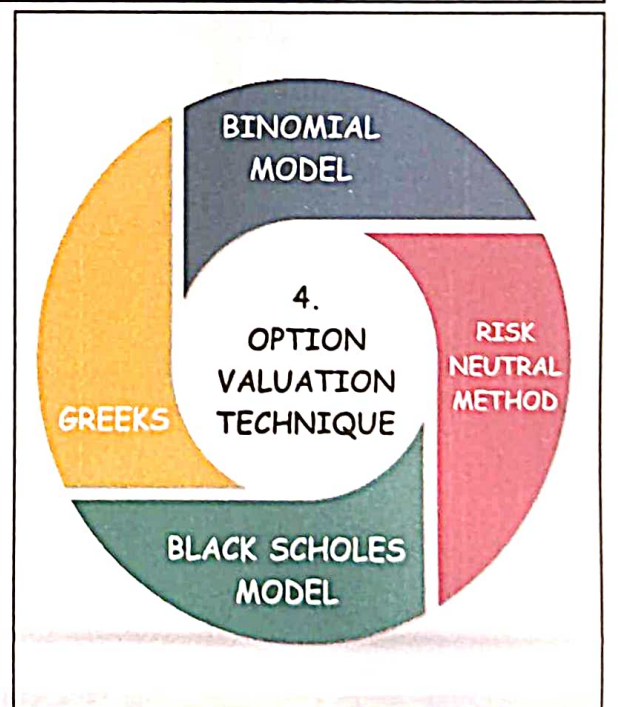
Mission

Objective /Goal

Cost Leadership

Product Differentiation

Derivative = A product whose value is to be derived from the value of one or more basic variables called bases.

2 Types of Financial Derivatives.

Forwards	Futures		Options		Swap

Futures:
- Single stock
- Index futures

Options:
- Stock options
- Stock index options

Swap:
- Plain vanilla swap
- Basic rate swap
- Asset swap
- Amortizing swap

3. TYPES OF FUTURES & OPTIONS CONTROLS

1. Stock, commodity or currency futures
2. Stock, commodity or currency options
3. Stock, index future
4. Stock, index option

4. OPTION VALUATION TECHNIQUE

- BINOMIAL MODEL
- RISK NEUTRAL METHOD
- BLACK SCHOLES MODEL
- GREEKS

(5)

OPTIONS

CALL OPTION

PUT OPTION

LONG CALL

SHORT CALL

LONG PUT

SHORT PUT

1] INTRINSIC VALUE OF CALL OPTION = [C] = MAX [0, S - X]

2] INTRINSIC VALUE OF PUT OPTION = [P] = MAX [0, X - S]

3] FAIR PREMIUM OF CALL = MAX $\left[S - \dfrac{X}{(1+RFR)^{t}}, 0 \right]$

4] FAIR PREMIUM OF CALL = MAX $\left[S - \dfrac{X}{e^{rt}}, 0 \right]$

5] FAIR PREMIUM OF PUT = MAX $\left[\dfrac{X}{(1+RFR)^{t}} - S, 0 \right]$

6] FAIR PREMIUM OF PUT = MAX $\left[\dfrac{X}{e^{rt}} - S, 0 \right]$

7] EXPECTED VALUE OF AN OPTION = $\Sigma \left[\begin{array}{l} \text{VALUE OF OPTION} \times \text{PROBABILITY} \\ \text{AT EXPIRY} \end{array} \right]$

8] $\dfrac{\text{PUT CALL PARITY THEORY [PCPT]}}{\text{VALUE OF CALL} \times \dfrac{X}{(1+RFR)^{t}}}$ = VALUE OF PUT + S

9] BLACK SCHOLES MODEL

A] $\dfrac{\text{VALUE OF CALL OPTION}}{\text{PREMIUM ON CALL}} = S \times N(d_1) - \dfrac{X}{e^{rt}} \times N(d_2)$

$d_2 = d_1 - \sigma\sqrt{t}$ or $\dfrac{l_n\left[\dfrac{S}{X}\right] + \left[R - 0.50\,\sigma^2\right] \times t}{\sigma \times \sqrt{t}}$

B]   VALUE OF

PUT PRIMIUM ON PUT $= \dfrac{X}{e^{rt}} \times [1 - n(d_2)] - S \times [1 - N(d_1)]$

c] WHEN DIVIDEND AMOUNT IS GIVEN IS QUESTION

$$d_1 = l_n \dfrac{\left[\dfrac{S - PV\ OF\ DIVIDEND\ INCOME}{X}\right] + \left[r + 0.50\ \sigma^2\right] \times t}{\sigma \times \sqrt{t}}$$

$$d_2 = d_1 - \sigma \sqrt{t}$$

10]   PUT - CALL RATIO $= \dfrac{VOLUME\ OF\ PUT\ TRADED}{VOLUME\ OF\ CALL\ TRADED}$

1. RISK MANAGEMENT

Any business activity entails varying degrees of uncertainty with regard to its operations. This is recognized as risk associated in conducting the business. The risk arises because of change in interest rates, exchange rates and input-output prices. Therefore, the business requires risk management products. The consumers, who receive the services or buy the products from these businesses, face risk when the price of services and products change. Therefore, the profits of these businesses also change. If such a business is listed, then their share prices too fluctuate. An investor holding such shares also face risk. These consumers and investors also require risk management tools. Here financial markets play a major role in providing many instruments that facilitates management of financial risk.

The underlying principle behind these instruments is the fact that a risk-averse individual pays a price to transfer the risk and an individual with higher risk-taking ability is willing to bear the risk for a price. The most popular amongst these products are financial Futures and options. Futures and options contracts are available for foreign exchange, interest rates, stock indices, equity and commodities. These products are also called derivatives.

2. DERIVATIVES

A Derivative is an instrument whose value is derived from the value of underlying assets, which may be commodities, foreign exchange, bonds, stocks, stocks indices, etc. Derivatives, such as futures and options, are financial nstruments whose price movements are derived from the price movement of an underlying security or asset. For example, in the case of a stock derivative, say 'stock futures,' the underlying asset is stock which is a common share. The value of 'stock futures' will be derived from the current price of the stock. Similarly, in the case of 'index futures,' say Nifty Futures, the NSE Nifty Index is the underlying asset.

2.1. Underlying in a derivative instrument

As defined above, a derivative is an asset which derives its value from the underlying. Here the price of the underlying is the main factor that determines prices of derivative securities, warrants and convertibles. Thus, a change in an underlying results in a simultaneous change in the price of the derivative asset that is linked to it. The underlying could be a stock, debt, commodity, foreign currency which gives rise to respective derivative instruments. Without the underlying, the derivative has no value. During the life of the derivative contract, the value is derived from the value of the underlying depending on the characteristics of the derivative instrument. Any long or short positions in the derivative contract undertaken is marked to the underlying value on a daily basis and at maturity the gain or loss is booked.

2.1. Need for derivative instruments

While managing various assets in doing business, facing risk common. The real challenge is identifying and managing them at minimum cost. The management involves mitigating or eliminating risk and then only the action can be termed as effective. Derivatives play a major role in risk management.

Consider an asset created out of many stocks, such as "portfolio of stocks'. As we have learnt, the total risk in the portfolio comprise of two parts, the unsystematic risk and the systematic risk. We know that we can eliminate the unsystematic risk by diversifying. However, we have to 'live' with the systematic risk component (i.e. we cannot eliminate it like the unsystematic risk). We could be in a situation where, after

creating the portfolio, we may have significant gains in the portfolio. At this juncture, we expect that stock prices are likely to fall and we intend to lock the gains. Using derivatives, we can create a situation where we lock the gains in the portfolio, while simultaneously assuming the systematic risk. In other words, if our asset values (stocks in the portfolio) are expected to fall owing to systematic risk, using derivatives, we can nullify the fall without altering the portfolio.

Also, some other times, one may have prior information on direction of asset prices. Using derivatives, one can speculate, and exploit the information on price movement of underlying asset prices and make gains . At times, we could be in a contingent position of procuring or selling an asset in future and we expect the prices of assets to rise or fall. Using derivatives, we can lock the future asset price and more importantly we would know that lock-in price beforehand.

In all these and several similar situations, we use an instrument whose price movement is associated with the price movement of the underlying asset under consideration. These instruments are nothing but derivatives of the assets like futures, options etc.

3. FORWARD CONTRACTS

It is the simplest form of a derivative. Consider a requirement to convert some quantity of a foreign currency (say $) that is expected to be received in a month's time. We would like to convert this $ currency to rupees on receipt. If we enter into a deal today with an authorized foreign exchange dealer for conversion of dollar to rupees in a month's time when we would actually receive the foreign currency (i.e. actual exchange of dollars to rupees in a month), then we are said to have entered into a forward contract. In case of $ forward contract negotiated between the two parties, the following terms are decided: a) the quantity of $ to be delivered, b) the period after which the delivery is to be made, and c) the price that the buyer would pay.

Any forward contract in general is a direct agreement between a buyer and a seller obligating the seller to deliver a specified asset of specified quality and quantity to the buyer on a specified date at the specified place. The buyer in turn is obligated to pay to the seller a pre-negotiated price in exchange for the delivery. In short, dealing today directly with the counterparty to settle at a later date is a forward contract. One of the parties who agree to buy the underlying asset assumes a long position and the other party assumes a short position and agrees to sell the same underlying asset on the same specified date for the same specified price.

| Buyer | ←————————————————————→ | Seller |
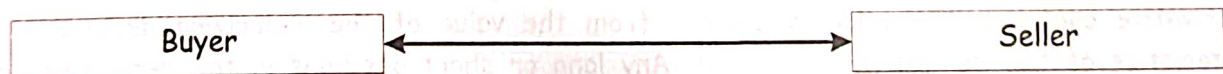
In a forward contract the deal is done over the phone/across the counter directly with the counterparty. The deal may be done for an odd quantity not necessarily standard quantity. Till the time the settlement takes place (actual exchange of currencies) there is no liquidity i.e. the agreement entered is only a document and cannot be traded. And more importantly, if the counterparty defaults, there is no recourse available i.e. in a forward contract, counterparty risk exists.

4. FUTURES CONTRACTS

Consider some of the disadvantages of a forward contract; the major one being the counterparty risk. Secondly, there is no liquidity and there is possibly no regulation i.e. a regulating authority is virtually absent. If we visualize the following situation where,

1. we consider doing deals on the regulated platform viz. the exchange,
2. transact standard quantities
3. a provision of counter party guarantee exists in case of default by the counterparty and
4. where sufficient liquidity to meet our intermediate requirements is available

Then we are talking of some features of futures contract. The overall structure of deal in a futures contract i.e. buying or selling today to settle at a later date, remains the same as it is in a forward contract, the way of deal making however changes i.e. instead of doing deal directly with the counterparty as in a forward contract, we transact in an exchange without the information on who the counterparty is, in a futures contract.

Buyer	←—	Exchange	—→	Seller

Thus a futures contract is also a standardized agreement between the buyer and the seller in terms of which, the seller is obligated to deliver a specified asset to the buyer on a specified date and the buyer is obligated to pay the seller the then prevailing futures price in exchange of the delivery of the asset. A futures contract invariably has a) the date on which the contract is being executed, b) the name of the underlying asset, c) the quantity of the asset d) the contract price and e)the period of the contract.

Future contracts overcome the weaknesses of the forward market by standardizing the products, providing liquidity as also counter party guarantee in case of default.

4.1. Futures and Forwards

Futures	Forward
Deals done through exchange	Deals done over the phone
Trade on an organized exchange	OTC in nature
Standardized contract terms	Customized contract terms
More liquid	Less liquid
Requires margin payments	No margin payment
Follows daily settlement and therefore mark to market losses possible	Settlement happens at end of period
Counter-party risk shouldered by the exchange clearing corporation	Counter-party risk to be borne the client
Dealt through intermediary	Dealt directly with the counter party

Future contracts of equities in India are cash settled like so many global markets. This means if a buyer of futures makes gains, at the end of expiry, he would be credited makes gains, the cash gains and vice versa i.e. cash settlement is done instead of physical settlement. He need not take delivery of the shares by paying money and then sell the shares in the cash market to reap the difference. This is despite the fact that buyer of futures carries the right to purchase the shares of underlying at expiry. Cash settlement is done as the current infrastructure is found inadequate for physical settlement process.

In India, we always have 3 future contracts for all permitted stocks and indices in the equity futures markets. They are 1 month, 2 month and 3 month futures contracts. The futures contracts expire on the last Thursday of the month. Once a contract expires, next business day we have birth of a new 3 month contract. At that time the old 3 month contract would have turned into 2 month contract and the 2 month one would have become 1 month contract, since one month has passed.

Examples of Futures Contract

Consider a company engaged in the manufacture of transformers, where the major raw material is copper. This company is expected to tender its bid for a huge order of supply of transformers to the state power unit. Assume manufacture time is nine months, but raw materials are required two months from now. The prices of copper are volatile in the market and it is expected to vary substantially in the next two months. In order to participate in the tender, the company needs to take certain price of copper into account. And if it wins the bid, it should have copper at that price and then only profits are expected as planned. The company would use the two months copper futures price for its calculation and simply buy copper futures today for settlement in two months when it requires copper. By doing this the company has ensured availability of copper at the same price that was used to calculate the bid while participating in the tender. By entering into this contract the company has acquired a right to buy copper at the contracted price after two months.

Consider a farmer producing wheat. He has a fair knowledge of the quantity of wheat that he would harvest. Ahead of the harvest season, the farmer would like to have an estimate of what proceeds he would receive at the end of harvest season i.e. he would be keen to know at what price he would sell his wheat. He can use the commodity futures market i.e. wheat futures. He would sell wheat futures today for settlement at a later date (coinciding with his harvest) in commodity exchange. By entering into this contract he has acquired a right to sell wheat at the contracted price at the end of harvest.

Consider a high net worth individual (HNI) holding equity shares of Reliance Industries Ltd. (RIL). If he expects the price of RIL to fall from the current levels, he would simply sell futures today (thereby getting the right to sell at the contracted futures price rate). At the end of the period when no more fall is expected he would terminate his contract (square off or do the opposite of the original trade; in this case he would buy). Thereby while holding the shares, without selling it, the HNI has participated in the fall and made profit i.e. Sell High and Buy Low. Alternately at the end of the contract period, the HNI would sell the shares in the cash market and reap the profit difference in the futures market (if the view that the price would fall materializes).In all the three cases the holder of the futures contract has right to deal at the contracted rate and the deal is completed only on settlement. The buyer has only the right to buy and he is not the owner of commodity or shares till the settlement takes place. Similarly the seller does not part with his produce till settlement.

5. OPTION BASICS

We know what an option is. For a recap, look at the adjoining box. We shall proceed to know how to profit from an option.

Option		
	Holder / Buyer	**Writer / Seller**
Call	Right to Buy	Obligation to Sell
Put	Sell	Buy

5.1. Why should you buy a Call

One reason as to why you should buy a call is that you expect the stock price to go up. There are other reasons also.

Let's explain this with an example. Today is Oct 14. You want to buy 100 shares of Krebs Ltd., currently priced at Rs. 250 because you think that it's price may go up to Rs. 300 in the next 30 days. This means that you will have to invest Rs. 25,000 today, wait for a month to see that the price touches Rs. 300 and then sell the 100 shares at Rs. 300, collect Rs. 30,000 and make a profit of Rs. 5,000.

Now, suppose you either don't have the money to invest Rs.25,000 or you are not 100% certain that the price will touch Rs.300. You worry that if the price falls to Rs.220 you will have to lose Rs.30 per share or Rs.3,000 on the whole. Steeper the fall, steeper would be the loss. How do you protect yourself?

Here's what you could do. Identify someone who is willing to sell to you the shares at Rs.260 anytime during the next month. If the other person (Let's call him Mr. Mentor) does not expect the price to rise beyond Rs.260 he will agree to it. This means that you are buying the right to buy 100 Krebs Ltd at Rs.260 on or before Nov 14, irrespective of the price it quotes on that day. On his part, Mr. Mentor is bound to sell to you if you turn up before Nov 14 to exercise your right. If on that day the price is Rs 290 he will still have to sell it to you at Rs. 260. On your part there is no obligation that you should exercise your right. For instance, if the price were less than Rs.260 on Nov 14, you wouldn't go & buy at Rs.260. You would let the right lapse and let Mr.Mentor hold the shares.

Note: Call is a right to buy; Put is a right to sell.

This therefore looks like a one-way deal where your loss is protected and Mr. Mentor's loss isn't. For taking the risk Mr. Mentor charges an upfront premium. Suppose this premium is Rs.5 per share. If by the due date you don't exercise your right, Mr. Mentor keeps the Rs.5 per share or Rs.500 as his gain. What he gained you lose out.

If on the due date you exercise your right the Rs.5 per share is still retained by Mr. Mentor. In our example, if the price touches Rs.290 on Nov 14th and you exercise your right, you gain Rs.290 less Rs.260 less Rs.5 per share. On Nov 14 you pay Mr. Mentor Rs.260 per share, sell Krebs Ltd elsewhere at Rs.290 per share, make a gross pack of Rs.30 per share and a net pack after adjusting the premium (of Rs.5 per share) of Rs.25 per share. On 100 shares that's a gain of Rs.2500. Mr. Mentor buys at Rs.290 sells to you at Rs.260, loses a gross of Rs.30 but because he collected a premium of Rs.5 his net loss is Rs.25 per share or Rs.2500 on 100 shares. What you gained he lost.

This was an example of a "Call option". Here you are the "Buyer" or "Holder" of the call option. You have the right and not the obligation to buy the underlying security. Mr. Mentor is the "Seller" or "Writer" of the call option. He has the obligation to perform. The Rs.5 is called the "Option premium" and is the price that the writer charges the buyer for selling him the right to buy the share. The Rs.260 is called the "Exercise price" or the "Strike price". Nov 14 is called the "Expiry date" i.e. the date by which the option has to be exercised.

The moral: As the buyer of a call option, your loss is restricted to the premium you pay but your gain is unlimited. In the above transaction you lose a maximum of Rs.500 while your gain would depend on the market price of the share. For the writer of the call option the gain is restricted to the option premium that he pockets for selling the right to you but the loss is unlimited. In the above case, Mr Mentor gains a maximum of Rs 500 and his loss would depend on the market price of the share. Further, unlike in the case of a share purchase where you had to shell out Rs.25,000 to buy 100 shares, here you have to invest only Rs500 to buy the right to buy 100 shares.

Golden Rules

* Buy a call option if you expect prices to go up.
* Buy a put option if you expect prices to come down.
* In both calls and puts your loss as a buyer is restricted to the amount of premium paid but your profits for a call is unlimited and for a put are limited to the exercise price if your expectations about the price are right.
* Write a put option if you expect prices to go up.
* Write a call option if you expect prices to come down.
* Writing is risky. Your profit is restricted to the amount of premium received but your losses in the case of a call is unlimited and in the case of a put is limited to the exercise price if your expectations about the price go wrong.

6. STOCK PRICE MOVEMENTS AND VALUE

A call option gives its owner the right to buy a stock at a specified price on or before the expiry date.

An increase in stock price is favorable to the call buyer because he can sell his shares at the higher market price. A drop in price is adverse because it fetches him a lower price and if the price falls below the exercise price he will have to let his option lapse.

The call writer sells the "right to buy"; that is he undertakes the obligation to sell. Hence an increase in stock price is adverse to him, and any reduction in stock price is favorable.

A put buyer buys the right to sell shares. An increase in stock price is adverse since he has bought the right to sell at a lower price. There is no point in buying high and selling low. In contrast, a decrease in price is favorable.

	RULE 1	
Party	Increase in price	Decrease in price
Call holder	Favorable	Adverse
Call Writer	Adverse	Favorable
Put Holder	Adverse	Favorable
Put writer	Favorable	Adverse

	RULE 2		
Option	Right to	EP < MP	EP > MP
Call	Buy	Exercise	Lapse
Put	Sell	Lapse	Exercise

The put writer grants the "right to sell"; that is he undertakes the obligation to buy. Hence any increase in stock price is favorable and any reduction in stock price is adverse to him.

The table RULE 1 summarizes the position.

Here is an easy-to-remember code. BUY LOW SELL HIGH.

A call gives the buyer the right to buy at Exercise Price. Thereafter, he could sell at market price. Hence in a call the EP is the buying price and the MP is the selling price. If the EP<MP, he would end up buying low and selling high which is good for him.

In contrast a put gives the buyer the right to sell at exercise price. Thereafter, he can buy at market price. Hence in a put the EP is the selling price and the MP is the buying price. If EP>MP he ends up selling high and buying low which is good for him. Hence if a buy-sell strategy leads to a gain, it is advantageous.

The table RULE 2 summarizes the position.

There is a second easy-to-remember code. Buy where it is cheaper, sell where it is costlier.

There are two markets, the derivative market and the stock market. The exercise price in the case of a call gives you the right to buy in the derivative market. Hence if EP<EMP, you should buy from the derivative market. That is, you should buy a call. The exercise price in the case of a put gives you the right to sell in the derivative market. Hence if EP>EMP, you should sell in the derivative market. That is, you should buy a put. If it's your interest to be a writer, you should become a call writer, if call buying is likely to lead to a loss. You should become a put writer, when put buying is likely to lead to a loss. The concept problems will make this clearer.

EXAMPLE 1 : TAKING STANCE

The strike price and the expected price on expiry are as given in Columns 1 and 2 respectively. The option expires 3 months down the road. What position would you take? The actual price on the expiry date is given in Column 3.

Exercise Price	Expected Price On expiry	Actual Price on expiry
280	260	280
225	225	230
60	75	55
70	55	60
50	60	50
110	110	100
370	360	380

SOLUTION

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
EP	280	225	60	70	50	110	370
EMP	260	225	75	55	60	110	360
Relationship	EP > EMP	EP = EMP	EP < EMP	EP > EMP	EP < EMP	EP = EMP	EP > EMP
Option Chosen	Put	No Action	Call	Put	Call	No Action	Put

7. IN-THE-MONEY, AT-THE-MONEY AND OUT-OF-THE-MONEY OPTIONS

An option is said to be "in-the-money" if exercising the option will result in a gain. An option is said to be "out-of-the-money" if exercising the option will result in a loss. An option is said to be "at-the-money" if exercising the option will result in neither a gain nor a loss.

In this context the option premium paid to buy these options is to be ignored since it represents a sunk cost.

The table RULE 3 drives home the issue in respect of the various situations for an option buyer.

RULE 3				RULE 4	
Relationship	Call Buyer	Put Buyer		For Buyer	For Writer
Exercise Price > Market Price	Out of the money	In the money		OTM: Bad	Good
Exercise Price = Market Price	At the money	At the money		ATM: Bad	Good
Exercise Price < Market Price	In the money	Out of the money		ITM: Good	Bad

The position is expressed only from the standpoint of the Buyer. Thus when an option is In-the Money it is good for the buyer and bad for the Writer.

EXAMPLE 2 : STATUS OF AN OPTION

You bought a one-month call option at a premium of Rs.6 with an exercise price of Rs.40. What is the status if the current market price (CMP) is (a) Rs.45 (b) Rs.40 or (c) Rs.35. Will the status change if you had been a put buyer? What is the corresponding status for the call seller and the put seller?

SOLUTION

EP Vs MP	Relationship	Call Buyer	Put Buyer
40 < 45	Exercise Price < Market Price	In the money	Out of the money
40 = 40	Exercise Price = Market Price	At the money	At the money
40 > 35	Exercise Price > Market Price	Out of the money	In the money

The option premium of Rs.6 is irrelevant being a sunk cost.

The status is the same for both Call Buyer and Call Writer except that for the Call Buyer while ITM is favorable, for the Call Writer it is adverse. Similarly while OTM is adverse for the Call Buyer it is favorable for the Call Writer.

Similarly the status is the same for both Put Buyer and Put Writer except that for the Put Buyer while ITM is favorable, for the Put Writer it is adverse. Similarly while OTM is adverse for the Put Buyer it is favorable for the Put Writer.

EXAMPLE 3 : STATUS OF AN OPTION

State whether each one of the following is In the money, At the money or Out of the money. If these prevail on maturity date what action will follow?

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Option	Call	Call	Call	Call	Put	Put	Put	Put
Exercise Price	60	50	110	30	110	105	12	25
Market Price	55	50	105	35	100	105	15	20

SOLUTION

Option	EP	MP	Status	Action
Call	60	55	Out of the money	Lapse
Call	50	50	At the money	Indifferent
Call	110	105	Out of the money	Lapse
Call	30	35	In the money	Exercise
Put	110	100	In the money	Exercise
Put	105	105	At the money	Indifferent
Put	12	15	Out of the money	Lapse
Put	25	20	In the money	Exercise

8. INTRINSIC VALUE AND TIME VALUE

An option's premium consists of two parts (a) Intrinsic value and (b) Time value.
Intrinsic value is that part of the option premium which represents the extent to which the option is in the money if it is in the money. This means that in respect of options that are at the money or out of the money there is no intrinsic value. i.e. intrinsic value cannot be negative.

Time Value is the difference between Option Premium and Intrinsic Value and is the premium paid for the time value of money. Time value falls with time and falls to zero on the expiration date. It cannot be negative.

RULE 5		
Status	**Intrinsic Value**	**Time Value**
ITM	If Call: MP - EP If Put: EP - MP	Max (P-IV, 0)
ATM	Nil	Premium
OTM	Nil	Premium

EXAMPLE 4 : INTRINSIC VALUE AND TIME VALUE

A stock with a current market price of Rs.50 has the following exercise price and call option premium. Compute intrinsic value and time value.

Exercise Price	45	48	50	52	55
Premium	5	6	4	5	7

SOLUTION

Exercise Price	Option Premium	Nature	Intrinsic Value	Time Value
45	5	ITM	5	0
48	6	ITM	2	4
50	4	ATM	0	4
52	5	OTM	0	5
55	7	OTM	0	7