UNIT IV

OPTIONS

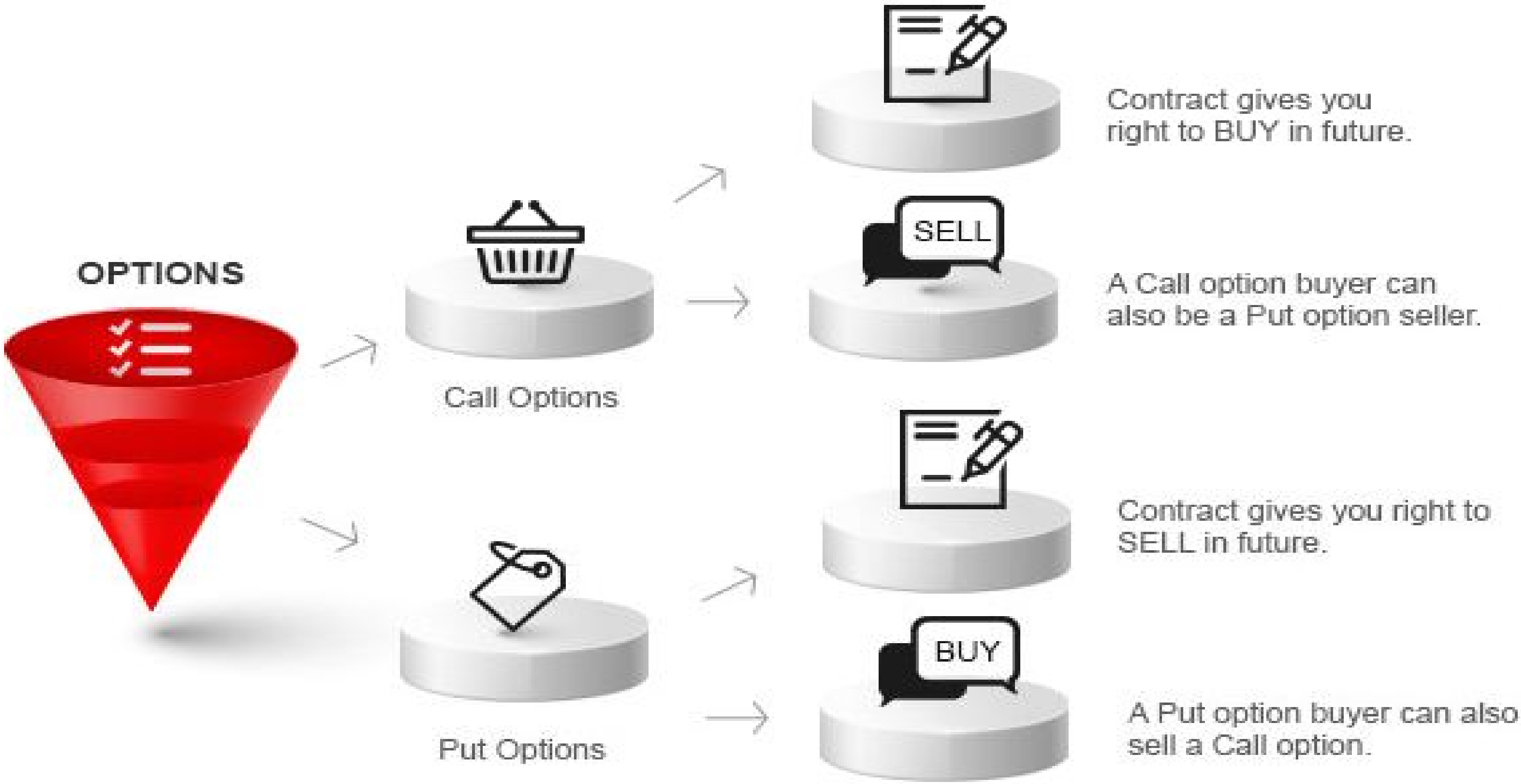
Options: Call and Put - Mechanics of Options Trading - Factors affecting Option Prices – Upper and Lower Bounds – Effect on Dividends – Trading Strategies: Spreads - Bull - Bear - Box - Butterfly – Calendar - Diagonal combinations – Options Pricing Model.

Options

- An **option** is a financial derivative instrument that specifies a contract between two parties for a future transaction on an asset at a reference price.
- The buyer of the option gains the right, but not the obligation, to engage in that transaction, while the seller incurs the corresponding obligation to fulfill the transaction.

Option Classifications

- ***Call Option*** : an option which gives buyer a ***right to buy*** the underlying asset at a strike price.
- ***Put Option*** : an option which gives seller a ***right to sell*** the underlying asset at strike price.



CALL OPTIONS V/S PUT OPTIONS

Some Terminologies

- **Option Price:** The amount per share that an option buyer pays to the seller
- **Expiration Date:** The day on which an *option* is no longer valid
- **Strike Price:** The reference price at which the underlying may be traded
- **Long Position:** Buyer of an option assumes long position
- **Short Position:** Seller of an option assumes short position

MONEYNESS OF OPTIONS

- **In-the-money:** Investor will profit by exercising the option.
- **Out-of-the-money:** Investor will make no money by exercising the option.
- **At-the-money:** A no-profit, no-loss scenario if Investors choose to exercise the option.

A Call Option is 'In-the-money' when the spot price of the asset is higher than the strike price. On the other hand, a Put Option is 'In-the-money' when the spot price of the asset is lower than the strike price.

INTRINSIC VALUE & TIME VALUE

- **Intrinsic Value (IV)** **-** **Call:** max $(S_T - K, 0)$

  PUT: max $(K - S_T, 0)$

- **Time Value (TV)** **-** **Call:** c-IV

  PUT: p-IV

Option Styles

- **European** option – an option that may only be exercised on expiration.
- **American** option – an option that may be exercised on any trading day on or before expiry.
- **Bermudan** option – an option that may be exercised only on specified dates on or before expiration.

CALL OPTIONS

CALL OPTIONS

- A call option is a financial contract between two parties, the buyer and the seller of option, to buy shares of stock at a specified time in the future. The buyer of the option has the right, but not the obligation to buy an agreed quantity of a particular share/commodity.
- The buyer pays a fee (called an option premium) for this right.
- Call options usually become more ***valuable as the value of the underlying asset increases.***

- An investor must pay to purchase a call option contract.
- The price of the European Call is denoted by c.
- Payoff:

$S_T > K$: Exercise the Call: $S_T - K$

$S_T < K$: Do not exercise it: 0

  - This can be written as max $(S_T – K,0)$

Cost: c

Profit/Loss: Payoff - Cost: [max $(S_T – K,0) – c$]

Payoff from a Long Call

Option Premium = Rs. 8

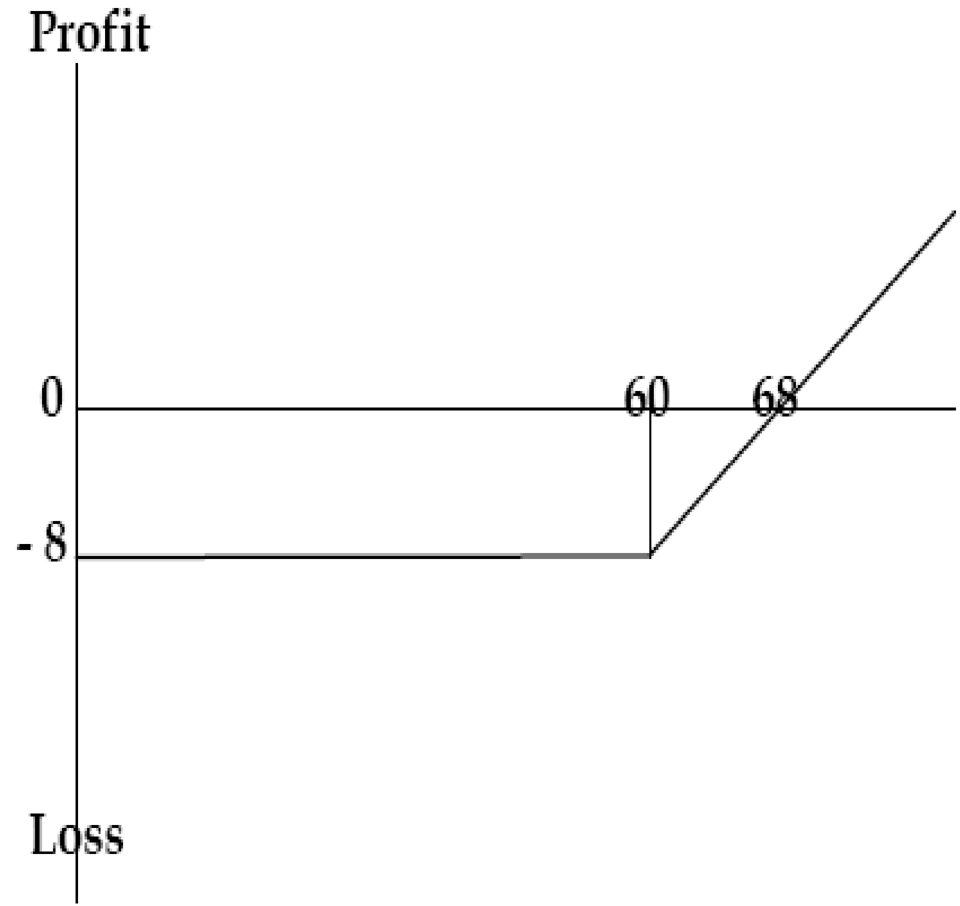
Strike Price = Rs. 60

Unlimited profit above break even.

Maximum loss limited to option premium below break even.

Break even = Strike Price + option Premium

Thus pay off from call = maximum of (zero or Market price – Strike Price)



Payoff from Short Call

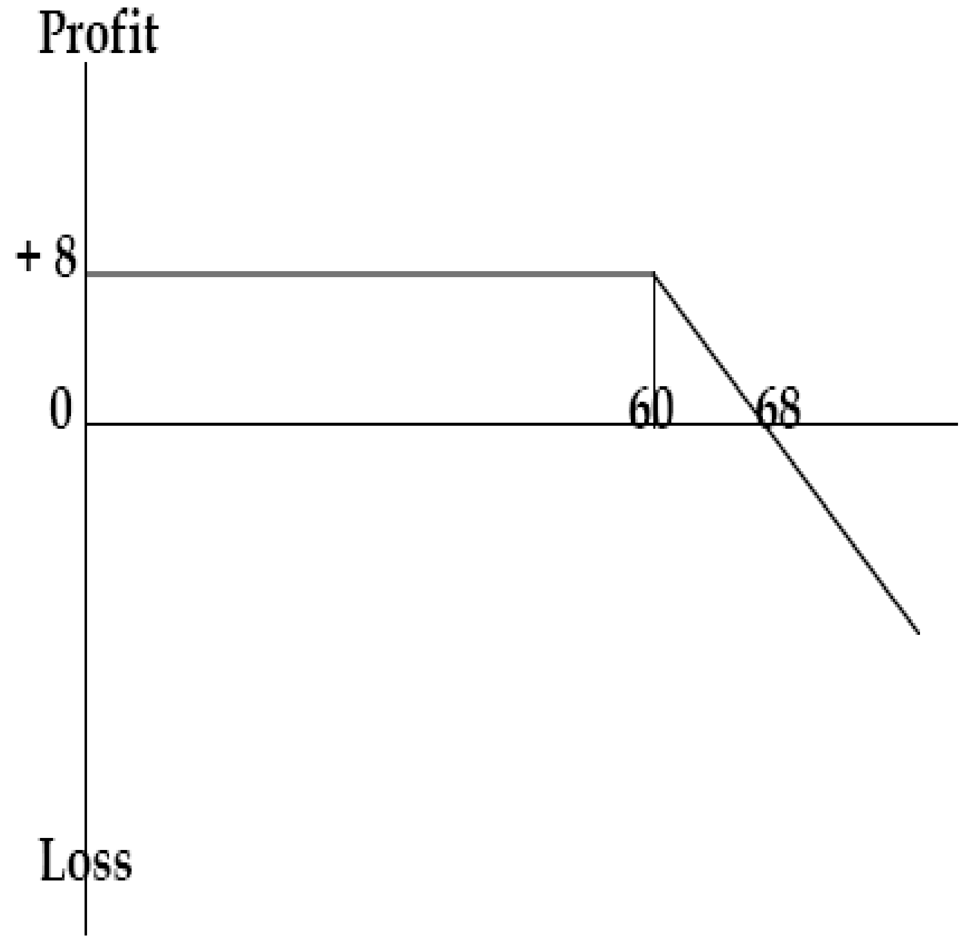
Option Premium = Rs. 8

Strike Price = Rs. 60

Unlimited loss above break even.

Maximum gain limited to option premium below break even.

Break even = Strike Price + option Premium



Summary of Call Option Strategies

Strategy	View on the underlying asset	Gain Potential	Loss Potential
Long Call	Bullish	Unlimited	Limited
Short Call	Bearish	Limited	Unlimited

PUT OPTIONS

PUT OPTIONS

- A put option is an option contract in which ***the holder (buyer) has the right*** (but not the obligation) to sell a specified quantity of a security at a specified price (strike price) within a fixed period of time (until its expiration).
- ***For the writer (seller) of a put option, it represents an obligation to buy the underlying security*** at the strike price if the option is exercised.
- The put option writer is paid a premium for taking on the risk associated with the obligation.

- An investor must pay to purchase a put option contract.
- The price of the put is denoted by p.
- Payoff:

  $S_T > K$: Do not exercise it: 0

  $S_T < K$: Exercise the put: $K - S_T$

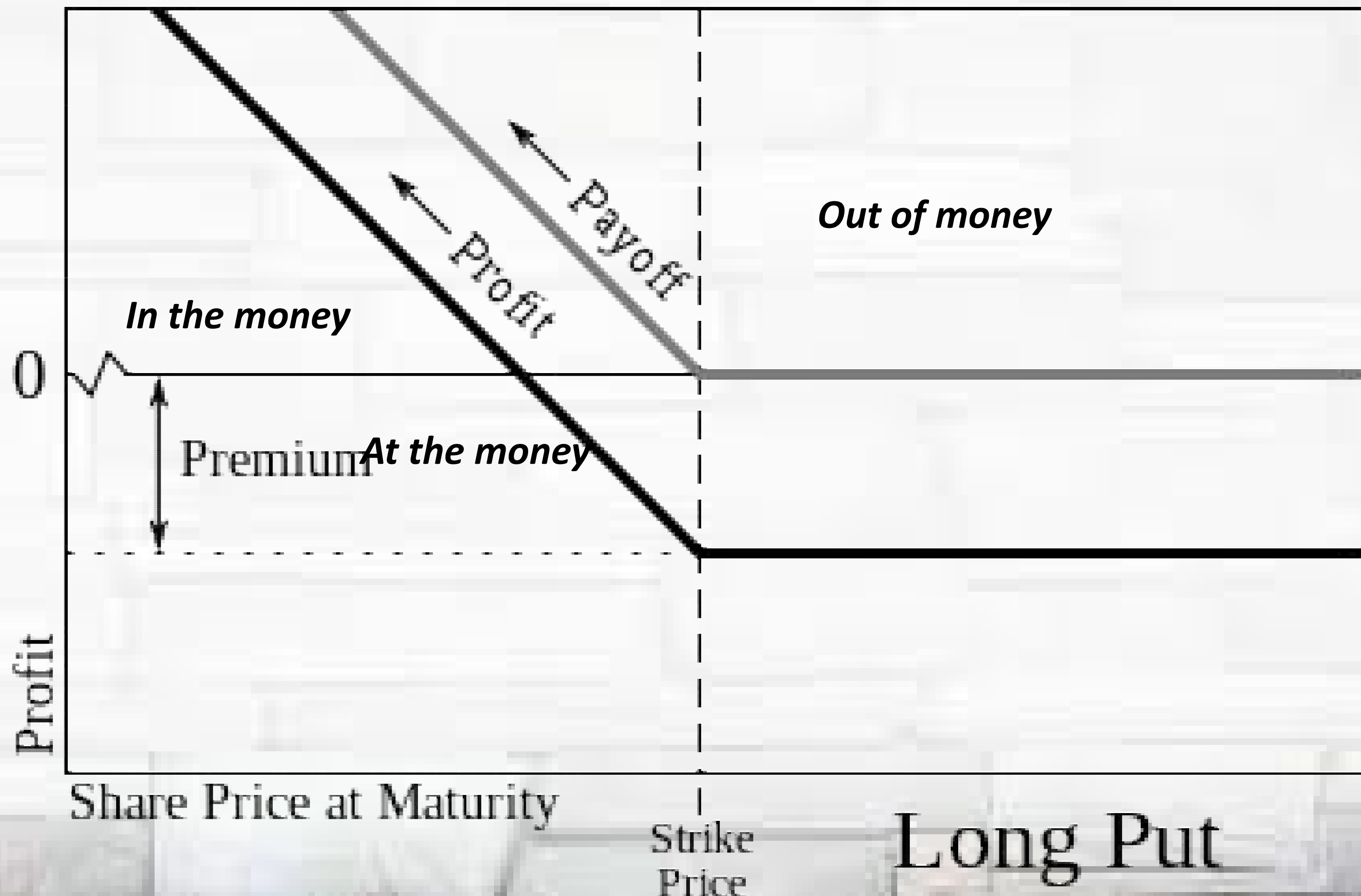
  - This can be written as $\max(0, K - S_T)$

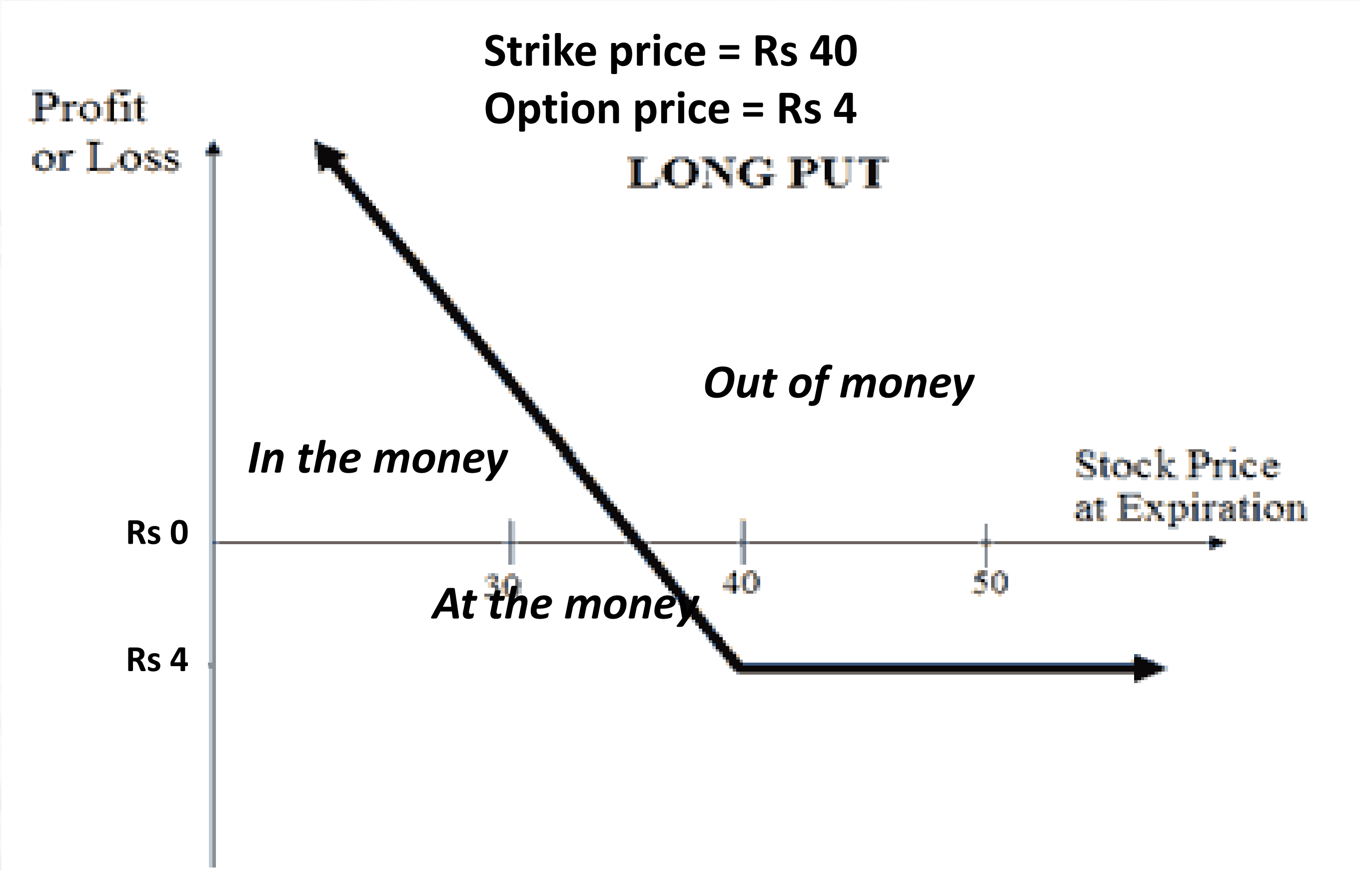
  Cost: p

  Profit: Payoff -Cost: $[\max(0, K - S_T) - p]$

BUYING PUT OPTIONS – LONG POSITION

- Put buying is the simplest way to trade put options. When the ***options trader is bearish on particular security***, he can purchase put options to profit from a slide in asset price.
- The ***price of the asset must move significantly below the strike price of the put options before the option expiration date*** for this strategy to be profitable.

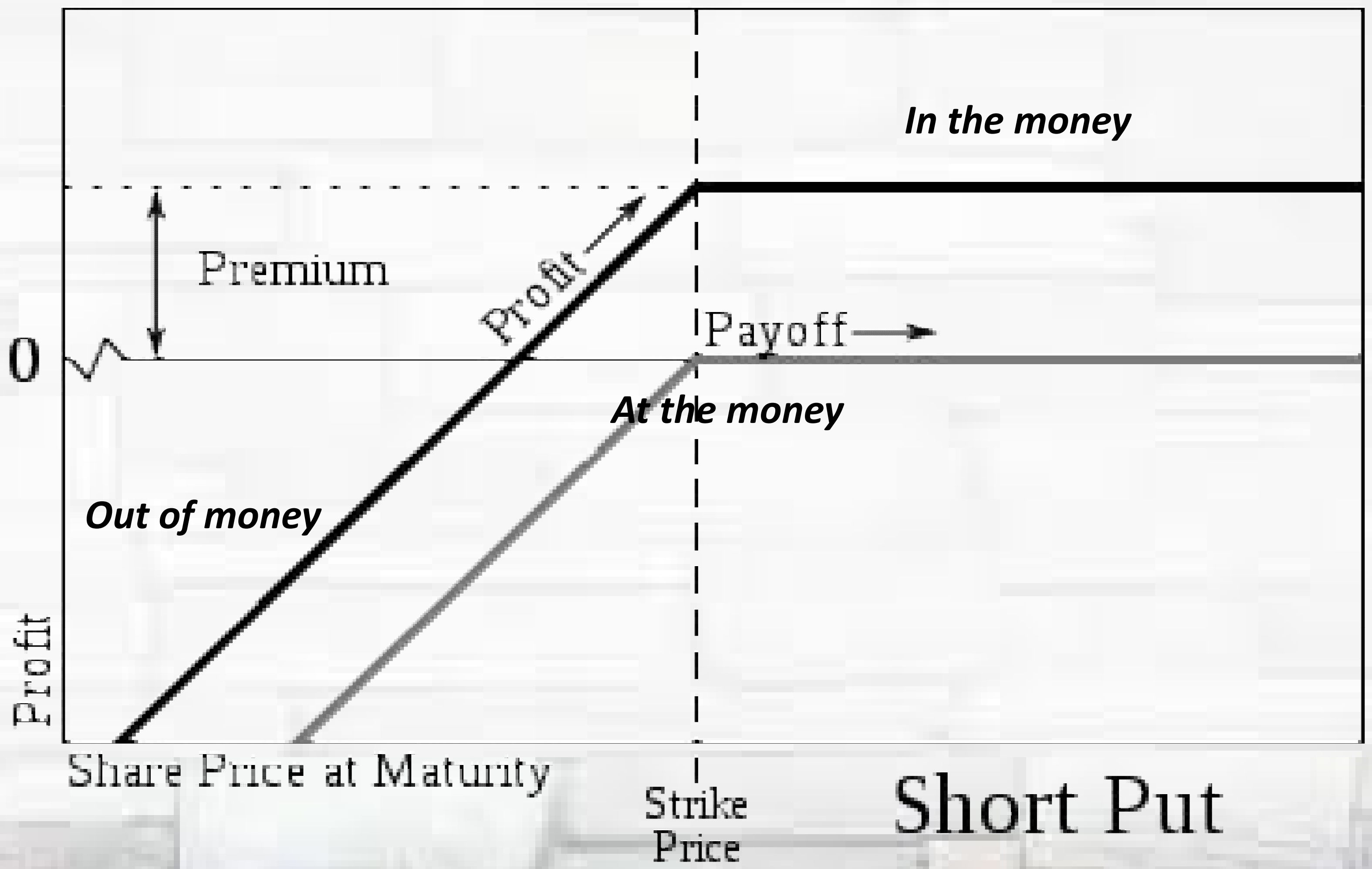

Payoff
Profit
Out of money
In the money
0
Premium
At the money
Profit
Share Price at Maturity
Strike
Price
Long Put

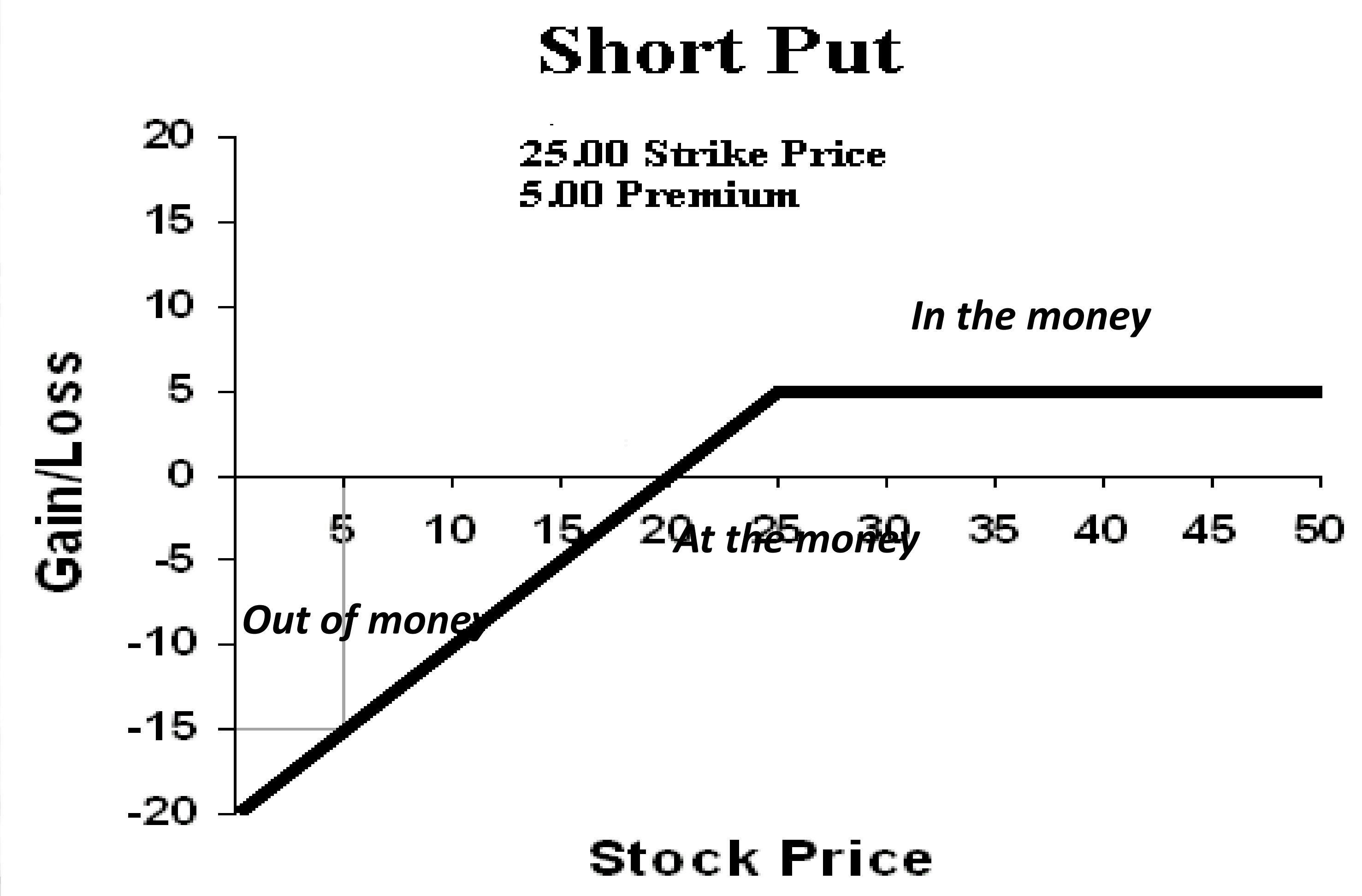


Strike price = Rs 40
Option price = Rs 4
LONG PUT
Profit
or Loss
Out of money
In the money
Stock Price
at Expiration
Rs 0
30
40
50
At the money
Rs 4

SELLING PUT OPTIONS – SHORT POSITION

- Instead of purchasing put options, one can also sell (write) them for a profit.
- Put option writers, also known as sellers, ***sell put options with the hope that they expire worthless so that they can pocket the premiums***.
- Selling puts, or put writing, involves more risk but can be profitable if done properly.


In the money
Premium
Profit
Payoff
0
At the money
Out of money
Profit
Share Price at Maturity
Strike Price
Short Put


Short Put
25.00 Strike Price
5.00 Premium
In the money
At the money
Out of money
Gain/Loss
Stock Price
20
15
10
5
0
-5
-10
-15
-20
5
10
15
20
25
30
35
40
45
50

4 Positions in Options / Pay-Off