Chapter

14

TECHNICAL ANALYSIS

There are two main approaches used in analysing the movement of share prices– the fundamental approach; and the technical approach. Fundamental approach helps one to estimate the future price of shares. It decides the share's future price with risk-return framework based on economy, industry and company analysis. In this approach, the principle decision variable takes the form of earnings per share and dividend pay-out. Fundamental analysis will not answer the two questions *(i)* should one buy today? *(ii)* what will be the price tomorrow, next week or next year? To answer these questions one has to depend on another analysis and it is technical analysis, lthough both the approaches have the same objective of buying at a lower price and selling at a higher price to get a good return on investment.

WHAT IS TECHNICAL ANALYSIS?

Technical analysis is based on the concept that the securities prices and volume in the past suggest their future behaviour. So the information on prices and volume can give an idea of what lies ahead. A trend in the prices is believed to continue unless there is some definite information leading to change, and this trend in prices can be used to predict the future prices. Thus, ***technical analysis may be defined as a process of identifying trend reversals at an early stage to formulate the buying and selling strategy on the expected changes.*** Trend reversal takes place when the trend will end and the prices would move in the opposite direction.

The technical analyst analyses the relationship between price-volume and supply-demand for the overall market and the individual share with the help of several indicators. Volume is favourable on the upswing *i.e.*, the number of shares traded is greater than before and on the downside *i.e.* the number of shares dwindles (becomes gradually less). If it is the other way, trend reversal can be expected.

ASSUMPTIONS

Technical analysis is based on certain assumptions, which are as follows :

The Market Discounts Everything

The first assumption is that the market discounts everything. This assumption signifies that the price at which the security is quoted represents the hopes, fear, inside information, muscle power etc. of the participants. The financial analyst may be buying on the hope that the scrip will rise to represent its true worth (on the assumption that it is under-priced). The company circle may be buying on the basis of inside information or to support the prices, bear operators may be covering their short-sales on the fear of a further loss and so on. All these factors are reflected in the price at which the scrip changes hands on the trading floor. The buyers create the demand for the scrip and the sellers create the supply of it. Whatever reasons prompt the buyer to buy and the seller to sell get represented or discounted in the price that the buyer pays for the scrip and the seller gets for it.

The Market Moves Intend

The second important assumption is that the market moves in trends, and the trend when established has a tendency to continue further in time and then reverses at some point of time. To put it differently, ***the market movement is orderly and not random***. This is the basic assumption without which analysing share price movement would be meaningless. If the market movement were to be quite random, rising and falling without any trend there would be no scope for predicting the future movements whatsoever.

History Keeps Repeating Itself

The third assumption is that history repeats itself over and over again. This assumption arises from the fact that human psychology does not change. In a bull market, the mass psychology that drives the prices upwards will be seen over and over again in other bull markets. On the same count, the mass psychology seen during a bear market will repeat itself in every successive bear market. To put this assumption differently, it can be stated that the ***mistakes made by the traders on the market will be repeated again and again.***

UTILITY OR SIGNIFICANCE OF TECHNICAL ANALYSIS

After defining technical analysis and laying down the assumptions which form the building stones for the subject, one has to understand the use or utility of technical analysis to the trader or investor. The main uses are as follows :

Knowledge of Entry/Exit Things

The very definition of technical analysis states that it is the process of identifying trend reversals at an early stage. Thus, the foremost use of technical analysis would be to make an early entry in the market when the market is likely to rise, and an early exit from the market when it is likely to reverse direction and move downwards. This aspect can be referred to as *timing ones entry and exit from the market.* Imagine the profit potential if one would be able to make an entry near about the bottom and make an exit near about the top in every market cycle. Now, this timing can be useful to both short-term traders and long term investors.

The short-term trader can find out the short-term trend and ride that trend. The long-term trader can trade the longer term trend.

Knowledge of Quick Rise/Fall Periods

Further, with the help of technical analysis, it is possible to identify periods wherein one can expect a quick rise or a quick fall in a short span of time. This single advantage can be of great help in accelerating the return on investment. At times it is possible to arrive at the probable price and time targets so that one can have a framework within which invest in the market. Also, it is possible to identify scrips that will rise or fall faster than the market or other scrips.

Application to Various Markets

Technical analysis can be *applied to various markets*. Apart from the stock market, analysts use the technical approach in trading the metal market, commodity market, currency market, etc. Technical analysis can be of immense use to the purchase manager, who buys items that have a tendency to fluctuate or follow a trend. To give an example the purchase manager of a cotton textile unit would find technical analysis an invaluable asset in timing his purchases of cotton.

A word of caution at this juncture would be in order. Though technical analysis can be quite useful to the trader or investor, it is not infallible. Technical analysis can and does fail at times and one should be alert and careful in its application.

TECHNICAL ANALYSIS V/S FUNDAMENTAL ANALYSIS

There are two main approaches used in analysing the movement of share prices– the fundamental approach and the technical approach. Both the approaches have the same objective of buying at a lower price and selling at a higher price to get a good return on investment. Thus, the end goal in both the cases is the same. However, there is a vast difference between the material studies and the basis of analysis to reach this goal.

A person who follows the fundamental approach known as the ***fundamental analyst*** would be concerned with the fundamental factors. His aim would be to arrive at the true worth of the share based on the current and future earning capacity of the company. If he finds that the share is quoted below its true worth, he would be buying and if, he finds that the share price is higher than its true worth, he would be booking profits or moving out of the scrip. A ***technical analyst***, on the other hand, is concerned with the direction of movement. He would be buying if he sees that the main trend (or the under-lying direction of movement) is rising and would be moving out of the scrip as and when he finds that the scrip is reversing direction. His approach is based on the analysis of the demand-supply equation. If the demand for a scrip is greater than its supply, the prices would be expected to rise prompting the analyst to buy. On the same count, if the supply of a scrip exceeds its demand, the prices would be expected to move downwards and he would exit from the scrip or book profits.

In theory, though there are two approaches to investing in the share market, more often than not the analyst is familiar with both the approaches. A technical analyst would look at

the basic fundamentals before investing and the fundamental analyst would bear in mind the technical position of the market. However, the ***basic differences between the two approaches are given in the following table*** :

Fundamental Analysis	Technical Analysis
1. Fundamental analysis refers to techniques which study company's profitability, financial position, expected growth to determine 'intrinsic' value of company's shares.	Technical analysis refers to techniques which study movements in market price of share and trading volume of share to predict the value of share in future.
2. Fundamental analysis assumes that stock price are mainly determined by financial performance/position of the company.	Technical analysis assumes that stock prices are mainly determined by demand and supply of stocks.
3. Fundamental analysis looks forward, since it discounts future earnings from stock to give its present value.	Technical analysis looks backward, since it analyses past price and volume trends.
4. Fundamental analysis generally takes long-term view point.	Technical analysis takes short-term view point.

THEORIES OF TECHNICAL ANALYSIS

Technical analysis is based on the doctrines given by Charles H. Dow in 1984 known as ***'Dow theory'*** and R.N. Elliott discovered the ***'Wave theory'*** in the early 1934. These two theories, besides some others, are the basis of technical analysis, which are being discussed in brief.

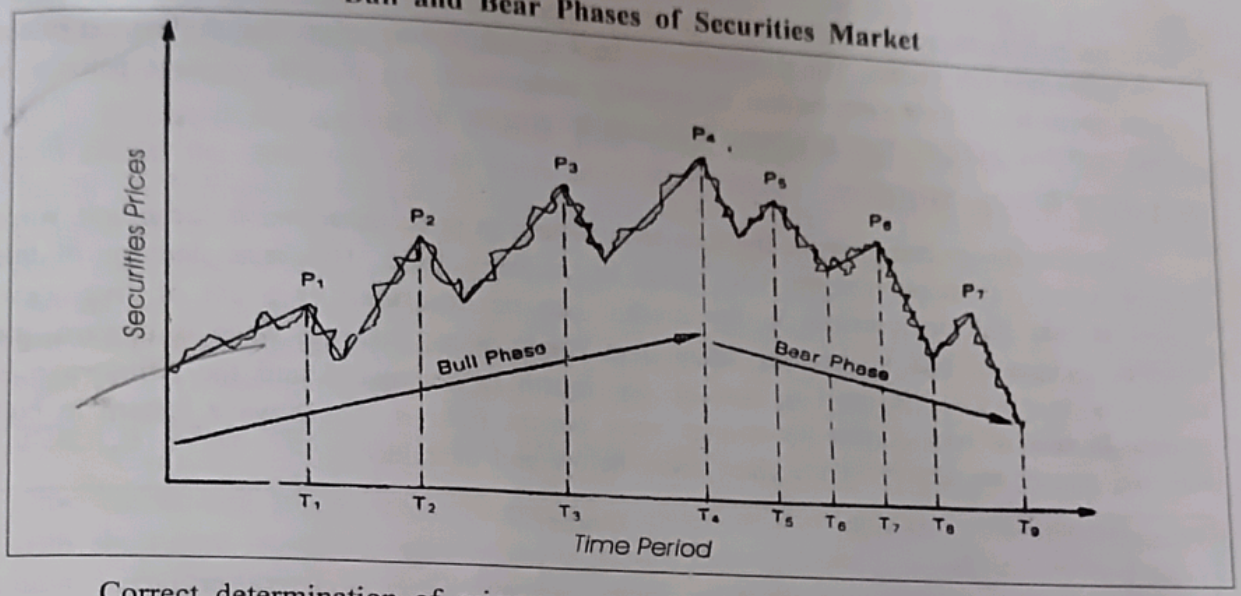
DOW THEORY

The initial form of technical analysis is referred to as Dow theory. Charles Dow developed this theory which is regarded as the basis of all other techniques used by technical analysts. Dow theory is based on the hypotheses that the stock market does not perform on a random basis. Rather, it is guided by some specific trends. The likely market trend in future can be predicted by following these trends. These specific trends are classified in following three categories in Dow theory :

(a) The Primary Movements;
(b) The Secondary Movements; and
(c) The Daily Fluctuations.

(a) ***The Primary Movements*** show the general and long-teem trend in market prices of shares and securities. In the case of marketable securities, a period of one to three years is regarded as a long period. General trends in movements of securities prices over this much long period are primary movements. In the long period, prices in securities markets show definite phases of rise or fall. A consistently rising trend is called as 'Bull' phase. A consistently declining trend is termed as 'Bear' phase. The chart given on next page shows these phases :

Bull and Bear Phases of Securities Market



Correct determination of primary movements is the major objective of Dow Theorists. The Dow Theory argues that the primary movements show the basic trends in the security market. According to this theory, if the cyclical swings of the securities price-indices are successively higher, the trend is up and there is a bull market. It may be noted that prices do not rise consistently, in bull phase. When the cyclical swings (rise and fall in prices) of price-indices are successively lower, then the market shows a down ward trend. Then, there is a bear market. It may be noted that prices do not fall consistently in bear phase. They show rise and fall, but the broad and basic trend is that of decline.

(b) ***The Secondary Movements*** are relatively shorter in duration. These may last for a few weeks to months. These movements are opposite in direction to the primary movements. They run counter to the primary trend. These movements make the primary trends.

(c) ***The Daily Fluctuations*** are in either direction. These are of minor character, and of lesser significance. These are irregular fluctuations and occur every day in the market. No definite trend is shown by these fluctuations. In majority of the cases, these fluctuations are the result of speculations. However, these must be charted on the graph and studied carefully because they make the longer-term movements.

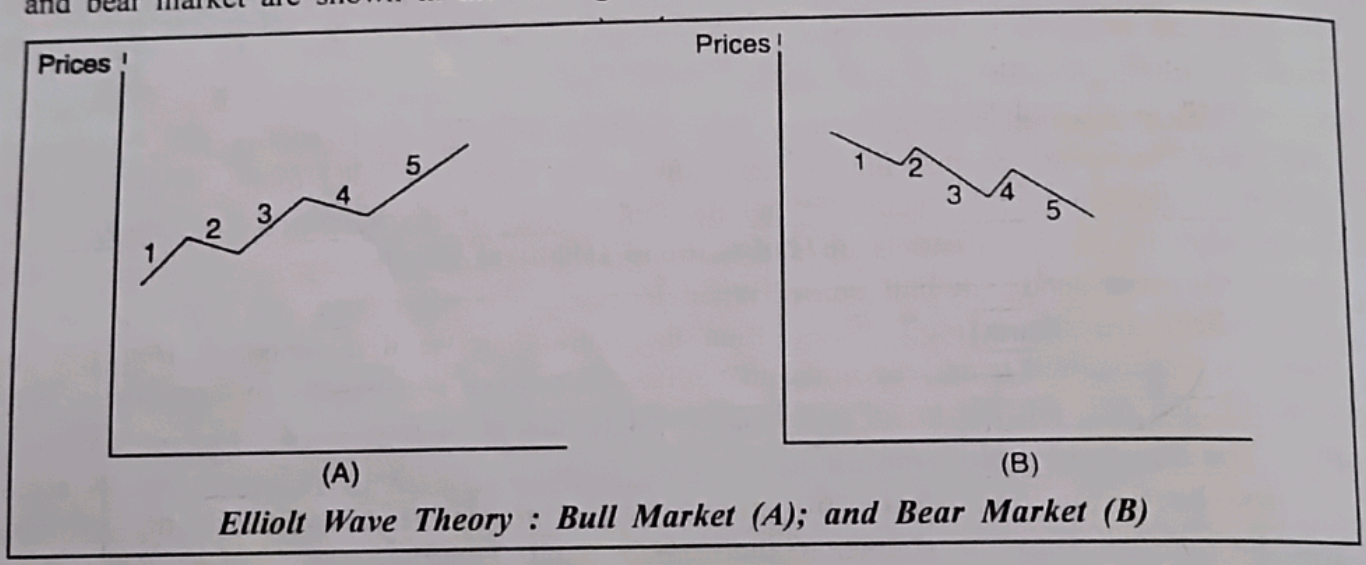
Dow Jone's Theory is helpful in determining the *timing of investment decisions*. An investor would like to invest in securities at such a time when prices are at lowest levels, and, to sell these securities when their prices reach the highest peak. Therefore, the investor has to time his decision for judicious management of investment in his portfolio. An investor may use the tenets of Dow Jone's Theory for identifying the timing of the beginning of rising or falling trend in securities prices. This is known as identification of the *turn* in the securities prices. Dow Jone's Theory identifies the *turn* by seeing whether the successive peaks and throughs are higher or lower than the earlier peaks and throughs.

This theory is based on the assumption that the behaviour of securities market itself contains trends which give clues to the future behaviour of the market prices. According to

this theory, funds should be invested in securities when upward primary movement (bull-trend) has begun and is likely to persist for some time. Funds should be reliased by selling securities when bear trend has started. The supporters of Dow Jone's Theory argue that the market prices can be predicted if their patterns can be properly understood. An analysis of these patterns is called technical analysis that has been discussed in chapter 14.

ELLIOLT WAVE THEORY

Another theory that explains the long-term pattern in price behaviour is the Elliolt Wave Theory which was discovered by R.N. Elliolt in the early 1934. The basic doctrine of this theory is that the stock prices in the market can be described as a set of five wave patterns. In case of bull market, the set of five waves is as: the first wave is upward, the second is downward, the third is upward, the fourth is downward and the fifth wave is inward. In case of bear market the reverse wave pattern follows. These wave pattern in bull and bear market are shown in the chart given below and described :



Elliolt Wave Theory : Bull Market (A); and Bear Market (B)

Wave Description : Elliot Wave Theory describes the basic movement in share prices. It states that there will be 5 waves in a given direction (going upward or downward). In case of bull market (upward trend), these 5 ways can be described as follows :

Wave 1 : The stock price make initial move upwards. This may be caused by a relatively small number of people that all of a sudden (for a variety of reasons) feel that the previous price of the stock was cheap and therefore it is worth buying and thus causing the price to go up.

Wave 2 : The stock is considered overvalued and enough investors who were in the original wave to consider that the stock was overvalued take profits. This causes the stock to go down. However, the stock will not make it to its previous lows.

Wave 3 : This may be the longest and strongest wave. More investors find out about the stock and they buy it for a higher and higher price. This wave usually exceeds the tops created at the end of wave 1.

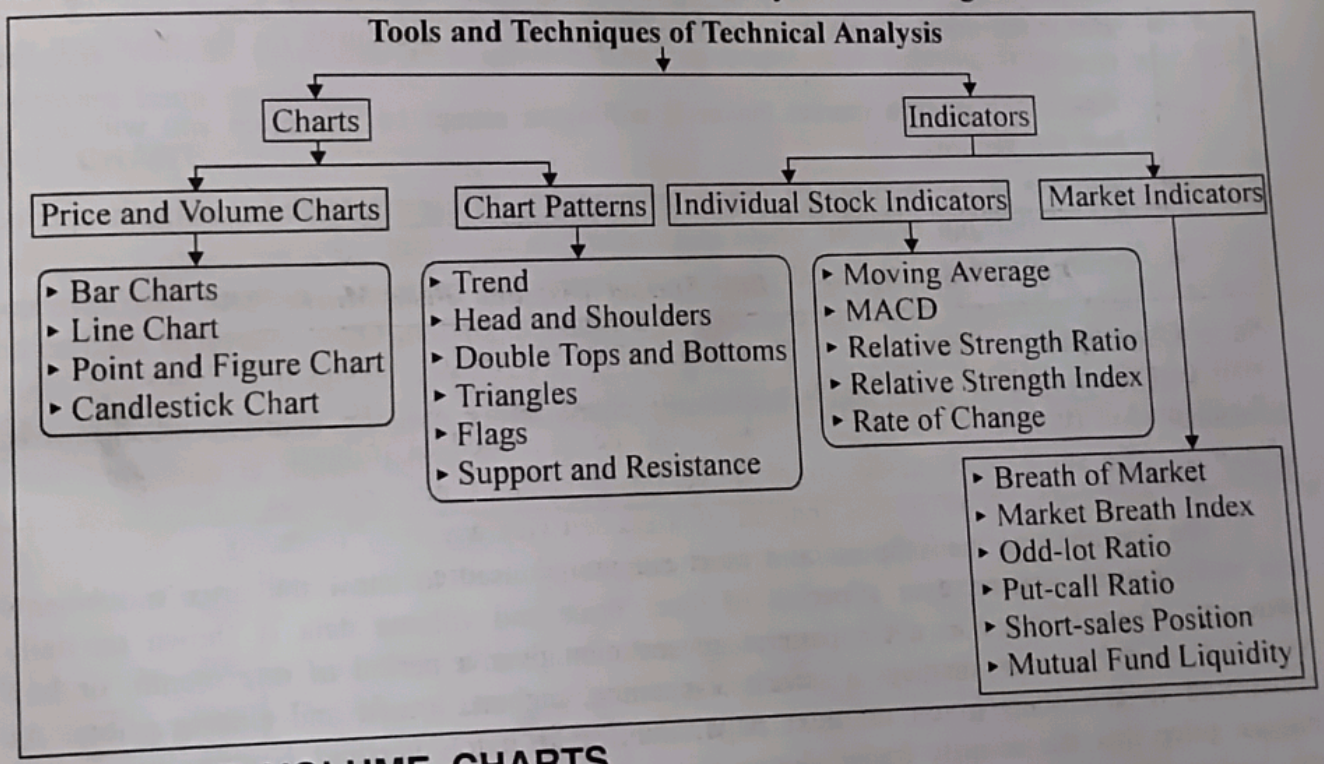
Wave 4 : At this point, investors again take profits because the stock is again considered expensive. This wave tends to be weak because there are usually more investors that are still bullish on the stock.

Wave 5 : This is the point that most investors are driven by hysteria. They will come up with lots of reasons to buy the stock which has very little negative news; consequently, the stock becomes overpriced. At this point, the stock will move into one or two patterns.

Out of these, the waves number first, third, and fifth are known as ***impulse waves*** and are in the direction of the basic movement. Other two waves, number second and fourth are correction waves and are against the direction of basic movement. After the completion of one set of 5 waves, the share prices may show a correction, known as ***ABC correction***. In ABC correction, the share price will go down / up / down in preparing for another set of 5 waves. Waves A and C will be against the direction of basic movement and wave B will be in the same direction as that of the basic trend. After the completion of eight (5 + 3) waves, the full cycle is over, and a fresh set of waves may arise.

TOOLS AND TECHNIQUES OF TECHNICAL ANALYSIS

Dow Theory and Elliott Wave Theory being simple help in identifying the long-term trends with short-term deviations around those trends. Over the years, several charts and patterns have been developed to extrapolate future prices from current prices. These charts and techniques are related to price pattern, price and volume data, average prices and some other variables. These can be classified as follow for the easy understanding :



PRICE AND VOLUME CHARTS

The basic objective of technical analysis is to identify the price trends on the basis of historical data; and the technical analyst known as 'chartist' uses charts and graphs as the basic tools to identify the trends in prices. Technical analysis may be used either for a specific security or for the market as a whole. In case of a specific security the past price and volume charts are used while in case of market, the aggregate data on prices and volume

are used to prepare charts. In technical analysis, price and volume data both for a specific security as well as for the market are used simultaneously.

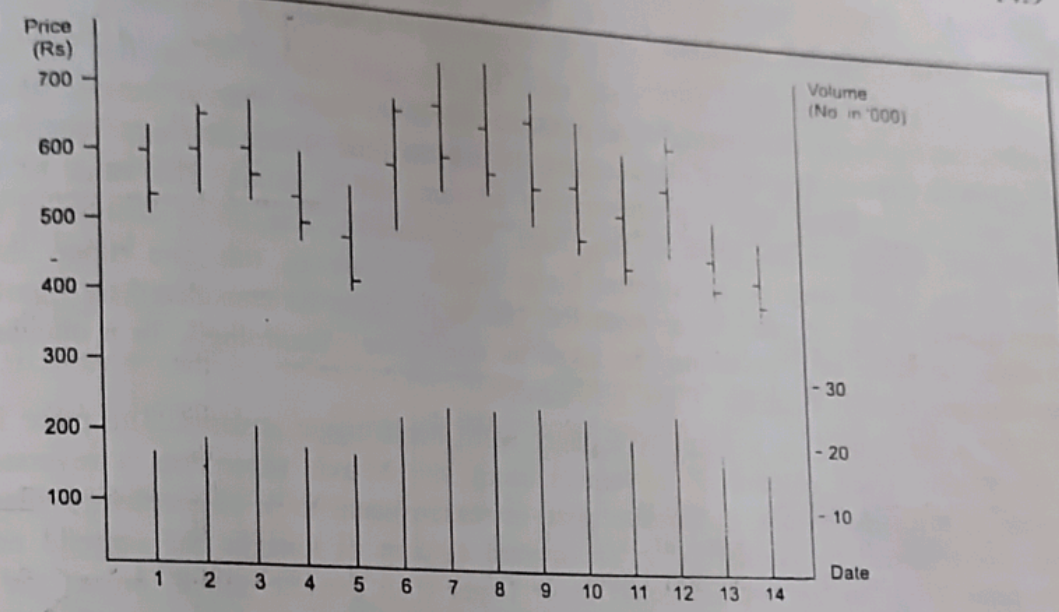
A price chart is a simple two-axis chart with time on X-axis and price on the Y-axis. The price of securities at different times are plotted on the graphs and charts. When the volume of transactions for a day is also shown in a price chart, it is known as **'Price-Volume Chart'**. In this chart, the volume data are displaced by individual histograms just below the price data. These volume bars can be prepared in different colours to show increase or decrease in price on that day. A security traded on the following different prices and volumes on any particular day are explained below :

- ***Opening price*** is the rate at which the first transaction takes place for the day. This price may be less, more or equal to the closing price for the previous trading day.
- ***Highest price*** is the highest rate for the day at which a transaction has taken place. It is the point at which there were more sellers than buyers.
- ***Lowest price*** is the lowest rate for the day at which the transaction has taken place. It is the point at which there were more buyers than sellers. Difference between the highest and lowest traded price is the price range for the day.
- ***Closing price*** is the last price at which security traded. Closing price is mostly used for analysis due to its availability. The relationship between the opening price and the closing price is considered significant by most technicians.
- ***Bid*** is the price a market maker is willing to pay for a security *i.e.* the price you will receive if you sell.
- ***Ask*** is the price a market maker is willing to accept *i.e.* the price you will pay to buy the security.
- ***Volume*** is the number of shares or contracts that were traded during the period the relationship between prices and volume is important.
- ***Open interest*** is the total number of outstanding contracts *i.e.* those that have not been exercised, closed or executed of a future or option. Open interest is used as an indicator.

Different types of price and price-volume charts being used by chartists are discussed hereunder :

BAR CHART

The bar chart is the simplest and most commonly used to show the price movements and accompanied volume over a period of time. Price and volume data is shown on daily basis and it can be used as a comparative presentation over a period of one month, or half year and so. a bar chart displays a security's opening, highest, lowest and closing prices. As illustrated in the chart given on next page, the top of each vertical bar represents the highest price that the security traded during the period, and the bottom of the bar represents the lowest price that it traded. A closing 'tick' is displayed on the right side of the bar to designate the last price that the security traded. If opening prices are available, a tick on the left side of the bar signifies them. Volume is usually displayed as a bar graph at the bottom of the chart. Most analysts only monitor the relative level of volume and as such, a volume scale is often not displayed.

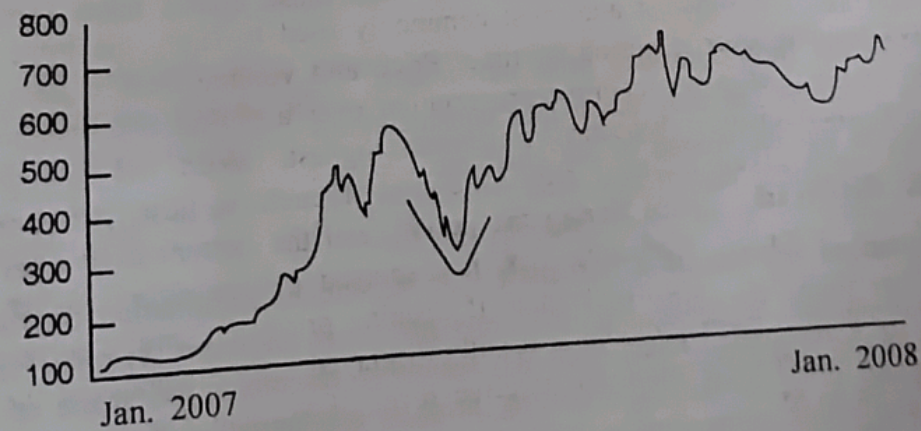


Bar Chart with Price and Volume Data

Studies based on bar charts have shown that volume goes with the price trend, *i.e.* generally volume increases with upward trend in prices and volume decreases with the downward trend in prices.

LINE CHART

A line chart is the simplest presentation of movement in any variable such as price of a security, volume of a security, index number, total volume at the exchange etc. In case of securities price line chart, time is taken on the horizontal axis and the price is taken on the vertical axis. The securities prices are plotted on the graph. All the points are then joined by a line. The line is known as the price (or variable) line. A line chart has a lot of visual power and even a layman can make an idea about the behaviour of prices or any other variable. A simple line chart is shown below :

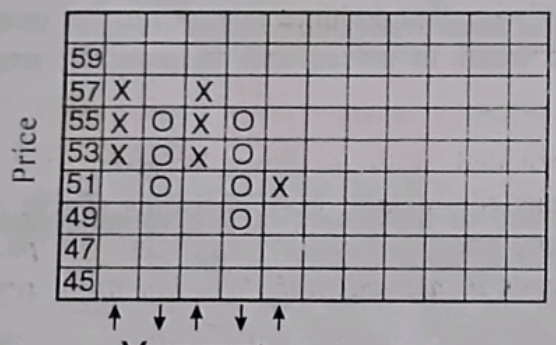


Line Chart

POINT AND FIGURE CHART

Point and Figure Chart (PFC) are used by technical analyst to predict the extent and direction of the price movements of a particular stock or stock market indices. It differs in the concept and construction from other charts. It has no time dimension and records changes in prices that are larger than a predetermined amount, called points. The value of the point chosen will depend on the price of the share. For example, one rupee change in the share price of Rs. 2,000 may be considered insignificant. However, this one rupee change for shares quoted at Rs. 20, Rs. 50 or even Rs. 100 is likely to be considered as significant. In this case, the value of a point may be taken as one rupee. Accordingly, in a one point PFC price changes smaller than Re. 1 are disregarded.

PFCs are plotted on a graph like paper with much bigger squares. The price is shown on the Y axis. Each column or movement along the X axis represents a reversal in the direction of price movement. Successive price increases, equal to or larger than predetermined points, are recorded by putting 'X' in an upward column as long as the uptrend continues. If the price drops by an amount equal to or larger than predetermined, points the chartist shifts to the next column and enters 'O' in a downward progression, until the trend is reversed. The follwing figure shows the point and figure chart :



Point and Figure Chart

Evaluation : PFCs are used to establish the trend, to identify previous areas of supply and demand and to determine when there has been a change of trend. Thus, PFCs allow investors to analyse price formations and spot buy and sell signals through trendline penetrations and break-out from support or resistence levels. Even then these charts have some inherent ***disadvantages*** such as

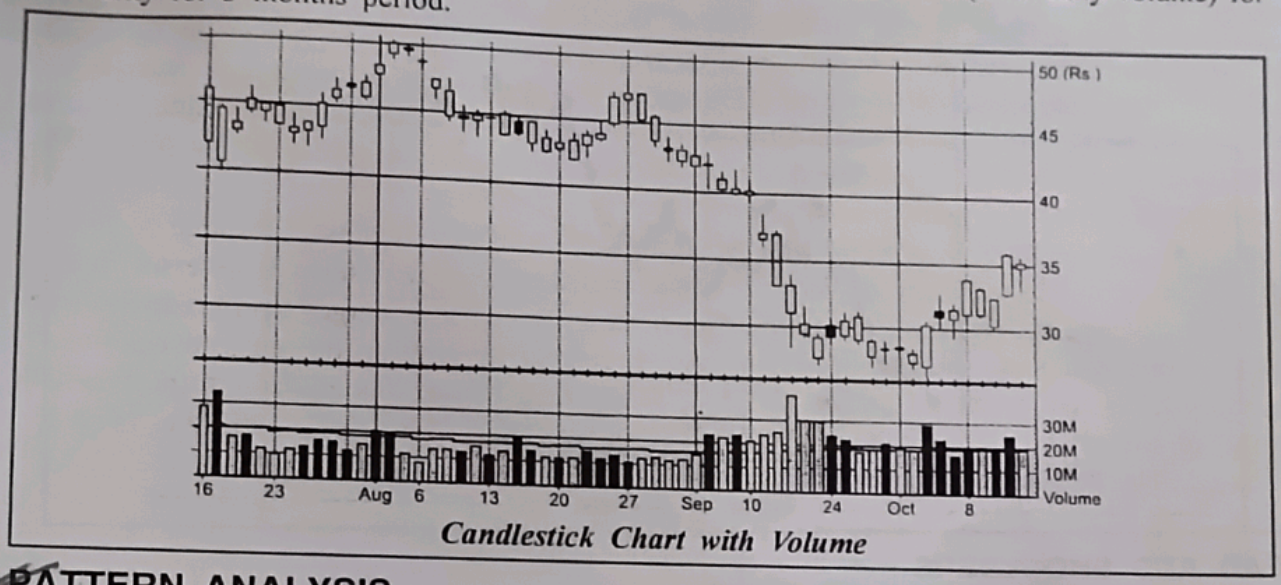
(i) They do not show intra-day price movements
(ii) Whole numbers are only taken into considerations
(iii) Volume is not mentioned in the chart etc.

CANDLESTICK CHARTS

It is an enhanced version of a bar chart with additional information on the opening price. A vertical bar joints the daily high and low prices. In between, opening and closing prices are shown by a rectangle. Thus, each day's activity resembles the shape of a candle-stick's. If the opening price exceeds the closing price, the rectangular portion is marked in black. A black candlestick represents a bearish trend. If the closing price is higher, the rectangular portion is white. A white candlestick represents a bullish trend. Absence of the

rectangle marks equality of opening and closing prices. This is known as 'doji' or neutral candlestick.

A candlestick chart can be prepared for a longer period and the volume data can also be depicted in the same chart. Following figure shows a candlestick chart (with daily volume) for a security for 3 months period.



Candlestick Chart with Volume

PATTERN ANALYSIS

The past and present price-volume data provided by these above discussed charts can be used by the investors to make logical predictions for making wise decisions. These charts can be analysed in two ways : (i) pattern analysis, and (ii) indicator analysis. The '***pattern analysis reveals the tendency of the price movements in a particular direction or to repeat the same formation over and over again.*** A chart pattern is a distinct formation on a stock chart that reflects a trading signal or a sign of future price movements. The price patterns can be used to forecast end of bull or bear phase; reversal of trend in prices, direction of the new change and confirmation of the new trend. Some of the most widely used and easily recognisable chart patterns are discussed hereunder.

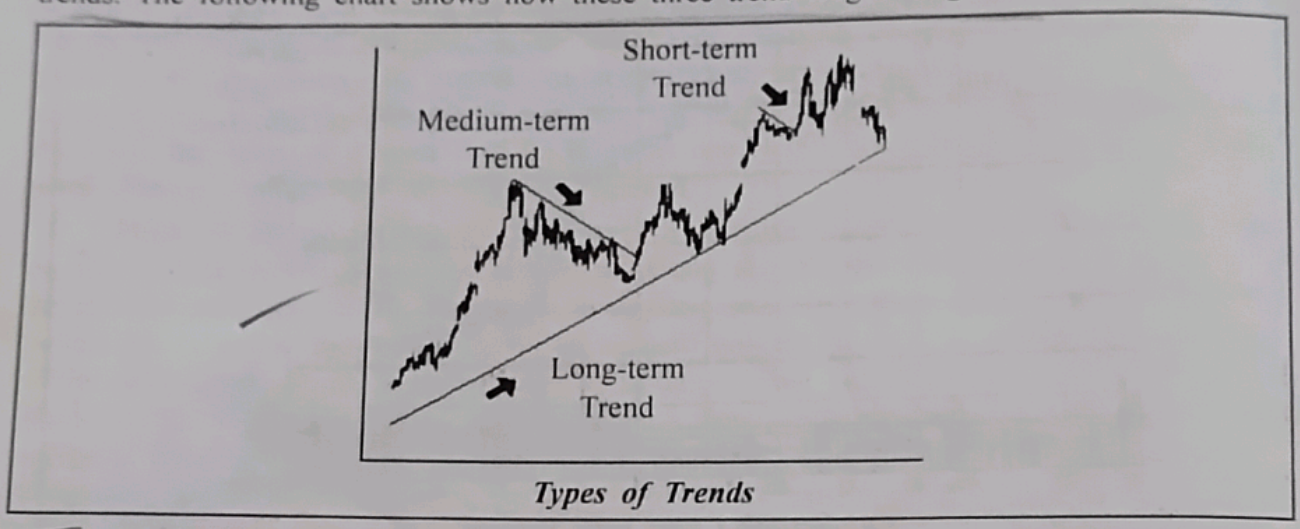
TREND

Trend is a long-term price pattern over a period of one year to three years. The basic tendency of the prices can be identified as increasing or decreasing trend. There are three types of trend : (i) up trends, (ii) down trends, and (iii) side ways/horizontal trends.

As the name imply, when each successive peak and trough is higher, it's referred to as an upward trend. If the peaks and troughs are getting lower, it's a downtrend. When there is little movement up or down in the peaks and troughs, it's a sideways or horizontal trend.

Trend Lengths : Along with these three trend directions, there are three types of trends. A trend of any direction can be classified as– (i) long-term trend, (ii) intermediate trend, and (iii) short-term trend. In terms of the stock market, a ***long-term trend*** is generally categorised as one lasting longer than a year. An ***intermediate trend*** is considered to last between one and

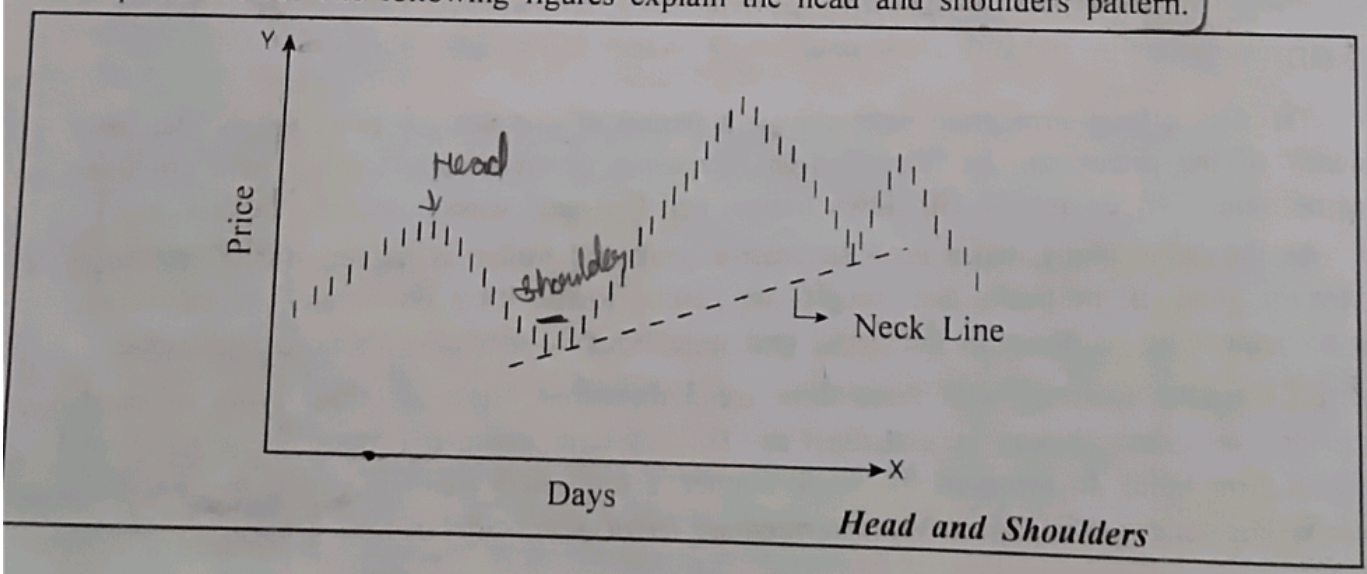
three months and a ***short-term trend*** is anything less than a month. A long-term trend is composed of several intermediate trends, which often move against the direction of the long-term trend. If the long-trend trend is upward and there is a downtrend correction in price movement followed by a continuation of the uptrend, the correction is considered to be an intermediate trend. The short-term trends are components of both long-term and intermediate trends. The following chart shows how these three trend lengths might look.



Types of Trends

HEAD AND SHOULDERS

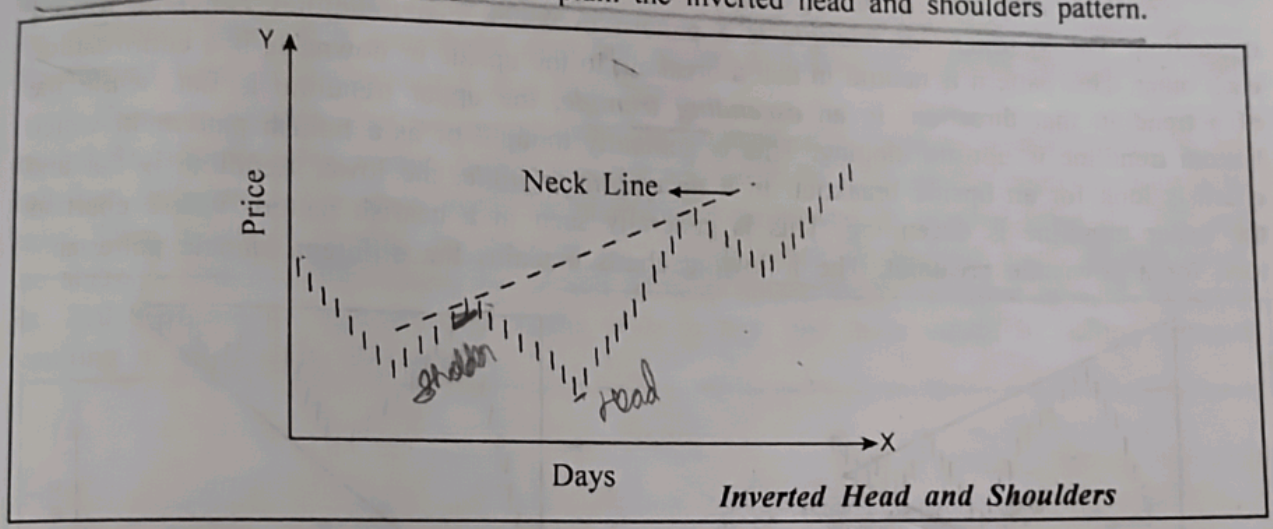
This is one of the most popular and reliable chart patterns in technical analysis. This pattern is easy to identify and the signal generated by this pattern is considered to be reliable. In the head and shoulder pattern there are three rallies resembling the left shoulder, a head and a right shoulder. A neckline is drawn connecting the lows of the tops. When the stock price cuts the neckline from above, it signals the bear market. The upward movement of the price for some duration creates the left shoulder. At the top of the left shoulder people who bought during the up trend begin to sell resulting in a dip. Near the bottom there would be reaction and people who have not bought in the first up trend start buying at relatively low prices, thus pushing the price upward. The alternating forces of demand and supply create new ups and lows. The following figures explain the head and shoulders pattern.



Head and Shoulders

INVERTED HEAD AND SHOULDERS

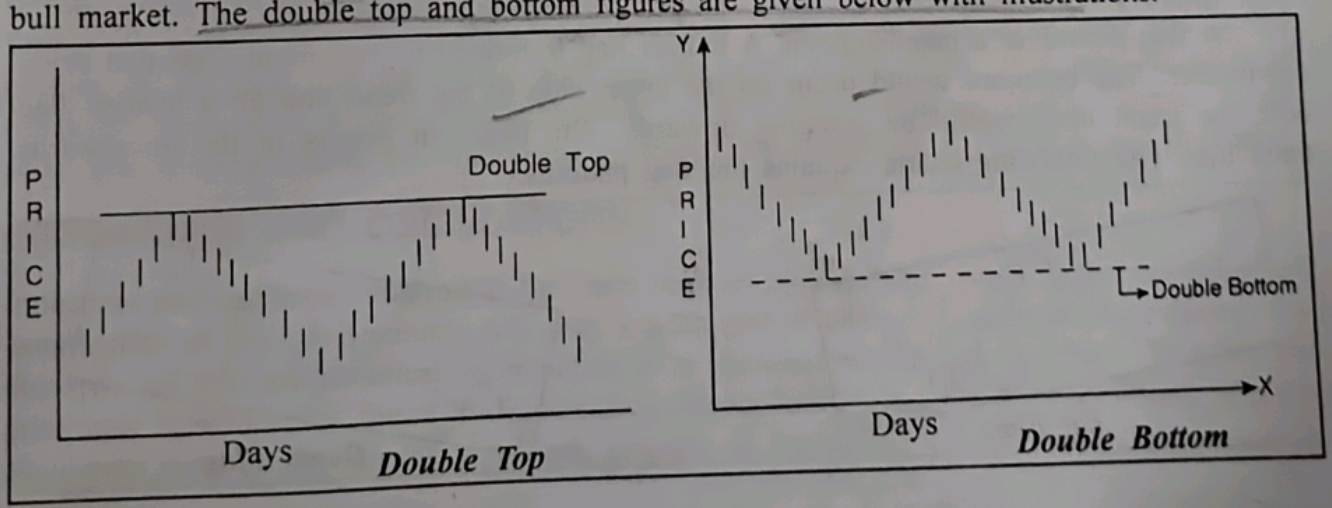
As the name suggests, this pattern is the reverse of head and shoulders pattern. It occurs at the end of a downward trend. The price of stock's falls and rises makes a inverted right shoulder. As the process of fall and rise in price continues, the head and left shoulders are created. Connecting the tops of the inverted head and shoulders gives the neckline. When the price pierces the neckline from below, it indicates the end of bear market and the beginning of the bull market. These patterns have to be confirmed with the volume and trend of the market. The following figures explain the inverted head and shoulders pattern.



Inverted Head and Shoulders

DOUBLE TOPS AND BOTTOMS

Generally tops and bottoms are formed at the beginning or end of the new trends. The reversal from the tops and both ends indicate sell and buy signals. If the ***double top*** is formed when a stock price rises to a certain level, falls rapidly, again rises to the same height or more, and turns down. Its pattern resembles the letter 'M'. The double top may indicate the onset of the bear market. But the result should be confirmed with volume and trend. In a ***double bottom***, the price of the stock falls to a certain level and increase with diminishing activity. Then it falls again to the same or to a lower price and turns up to a higher level. The double bottom resembles the letter 'W'. Technical analysts view double bottom as a sign for bull market. The double top and bottom figures are given below with illustrations.

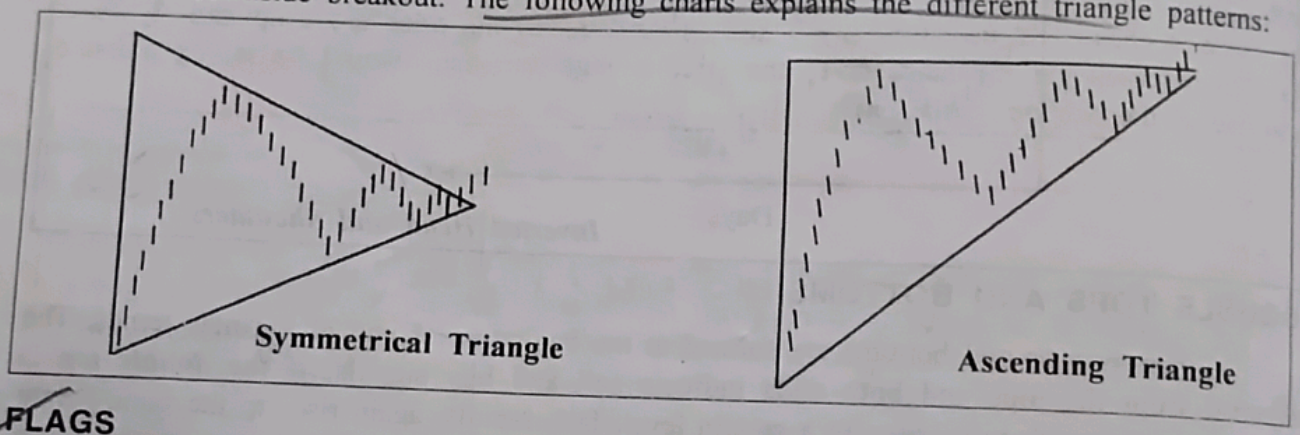


Double Top *Double Bottom*

TRIANGLES

The triangle formation is easy to identify and popular in technical analysis. A triangle is formed when each succeeding peak is lower than the preceeding peak and each succeeding both end is higher than the preceeding bottom. The series of peaks and bottoms are joined by a line which converges and forms a shape of a triangle. When the prices break out of the sides of the triangle there may be a sharp reversal of prices. The triangle formation may appear during a bull phase or a bear phase.

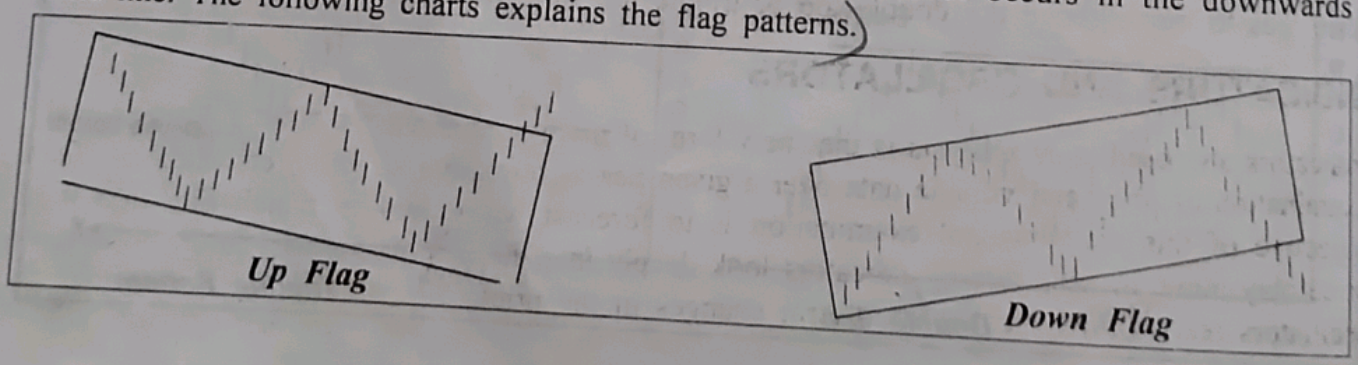
Triangles may take different forms which are known as symmetrical, ascending and decending. The ***symmetrical triangle*** is a pattern in which two trendlines converge toward each other. This pattern is neutral in that a breakout to the upside or downside is a confirmation of a trend in that direction. In an ***ascending triangle***, the upper trendline is flat, while the bottom trendline is upward sloping. This is generally thought of as a bullish pattern in which chartists look for an upside breakout. In a ***decending triangle***, the lower trendline is flat and the upper trendline is decending. This is generally seen in a bearish pattern where chartists look for a downside breakout. The following charts explains the different triangle patterns:



FLAGS

Flag pattern is commonly seen on the price charts. These patterns emerge either before a fall or rise in the value of the scrips. These patterns show the market corrections of the overbought or oversold situations. The time taken to form these patterns is quick. Each rally and setback may last only three to four days. If the pattern is wider it may take three weeks to complete the pattern.

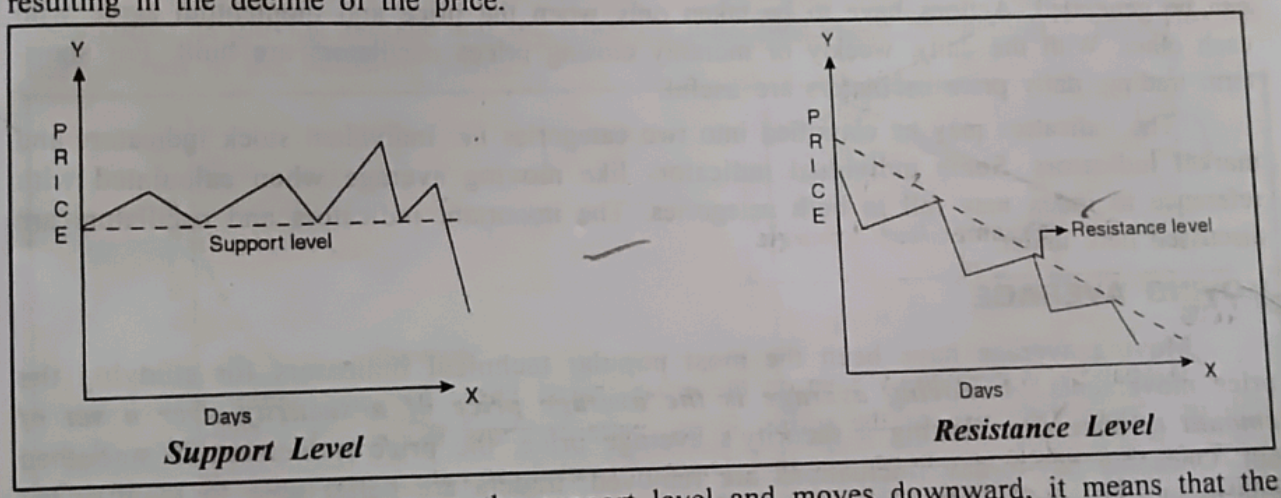
A flag resembles a parallelogram. A bullish flag is formed by two trend lines that stoop downwards. The breakout would occur on the upper side of the trend line. In a bearish flag both the trend lines would be stooping upwards. The breakout occurs in the downwards trend line. The following charts explains the flag patterns.



SUPPORT AND RESISTANCE LEVEL

The support and resistance levels are those price levels at which the declining trend or rising trend are expected to take a turn and move in reverse direction. These levels are determined on the basis of past data and guides in the determination of the level below which or above which price may not fall or rise. A ***support level*** is the price level below which the market is unlikely to fall, while the ***resistance level*** is one above which the price is unlikely to rise. In other words, ***support levels indicate the price where the majority of investors believe that prices will move higher and resistance level indicate that price of which a majority of investors feel prices will move lower.*** In case the prices increases beyond the resistance level, it is considered as a bull signal, and when the prices come down from the support level, it is considered as a bear signal.

This can be explained numerically say, for example, if a share price of ITC Ltd. hovers around Rs. 150 for some weeks, then it may rise and reach Rs. 210. At this point the price halts and then falls back. The share keeps on falling back to around its original price Rs. 150 and halts. Then it moves upward. In this case Rs. 150 becomes the support level. At this point, the share is cheap and investors buy it and demand makes the price move upward. Whereas Rs. 210 becomes the resistance level, the price is high and there would be selling pressure resulting in the decline of the price.



If the scrip price reverse the support level and moves downward, it means that the selling pressure has overcome the potential buying pressure, signalling the possibility of a further fall in the value of the scrip. It indicates the violation of the support level and bearish market. If the scrip penetrates the previous top and moves above, it is the violation of resistance level. At this point, buying pressure would be more than the selling pressure. If the scrip was to move above the double top or tripple top formation, it indicates bullish market.

INDICATORS AND OSCILLATORS

Indicators and oscillators analysis is the new form of price-volume charts. It is a mathematical examination of price and volume data over a given period through a series of calculations. The objective of this mathematical examination is to forecast where and in which direction the price may move in near future. Indicators look deeply into the past to forecast future, whereas oscillators react quickly to the short-term changes in the prices.

Indicators : Indicators are calculations based on the price and the volume of a security that measures such things as money flows, trends, volatility and momentum. Indicators are used as a secondary measures to the actual price movements and add additional information to the analysis of securities. Indicators are used in two main ways– to confirm price movement and the quality of chart patterns, and to form buy and sell signals.

There are two main types of indicators– leading and lagging. A ***leading indicator*** precedes price movements, giving them a predictive quality, while a ***lagging indicator*** is a confirmation tool because it follows price movement. A leading indicator is thought to be the strongest during periods of sideways or non-trending trading ranges, while the lagging indicators are still useful during trending periods.

Oscillators : Oscillators indicate the market momentum or scrip momentum. Oscillator shows the share price movement across a reference point from one extreme to another. The momentum indicates–(i) overbought and oversold conditions of the scrip or the market; (ii) signalling the possible trend reversal; and (iii) rise or decline in the momentum.

Generally, occillators are analysed along with the price chart. Ocsillators indicate trend reversals that have to be confirmed with the price movement of the scrip. Changes in the price should be correlated to changes in the momentum, and then only buy and sell signals can be generated. Actions have to be taken only when the price and momentum agree with each other. With the daily, weekly or monthly closing prices oscillators are built. For short-term trading, daily price oscillators are useful.

The indicators may be classified into two categories *i.e.* individual stock indicators and market indicators. Some individual indicators like moving average when calculated with reference to index may fall in both categories. The important indicators and oscillators are discussed here under.

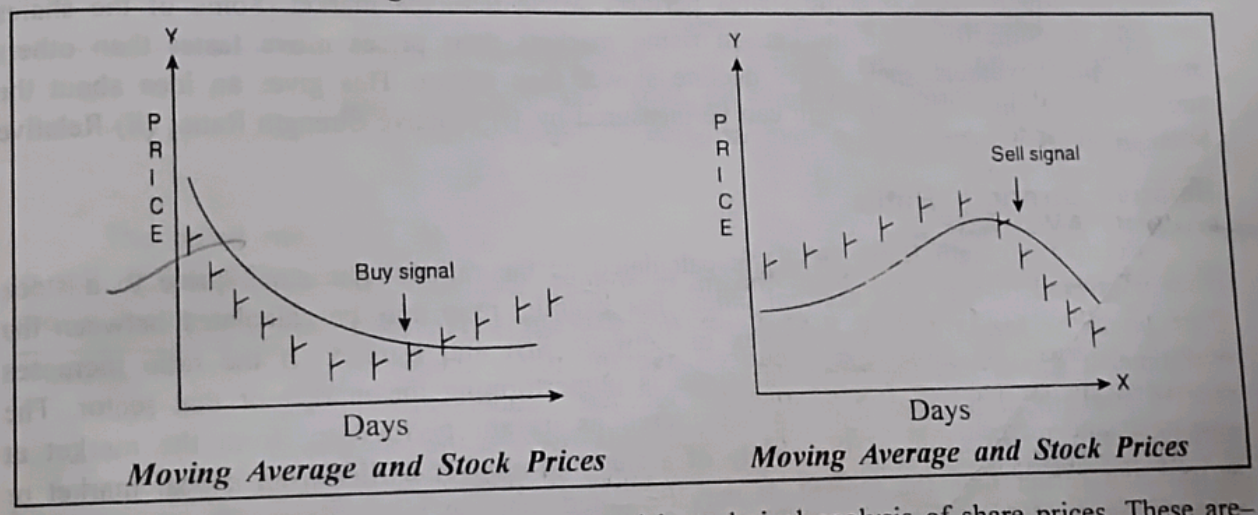
MOVING AVERAGE

Moving average have been the most popular technical indicators for studying the price movements. ***A moving average is the average price of a security over a set of amount of time.*** By plotting a security's average price, the price movement is smoothed out. Once the day-to-day fluctuations are removed, traders are better able to identify the true trend and increase the profitability that it will work in their favour. In order to calculate the moving average, the sum of a specific number of previous closing prices is divided by the number of observations. A sequence of averages is calculated by calculating the average on daily basis. For instance, if it is a five day moving average, on the sixth day the body of data moves to include the sixth day observations eliminating the first day's observations, likewise it continuous. Thus, each week the moving average is calculated by droping the oldest week and adding a new week (latest). An example of the calculation of a 5-week Moving Average is given on next page :

Calculation of Five-Day Moving Average for DLF Ltd.

Day	Price	Average
Sept. 4, 2008	255	–
5	261	–
8	269	266.2
9	273	270.8
10	273	272.8
11	278	273.2
12	271	274.0
15	271	273.8

If the security's price is above its moving average, it means that investor's current expectations (*i.e.* the current price) are higher than their average expectations over the last 5 weeks, and those investors are becoming increasingly bullish on the security. Conversely, if today's price is below its moving average, it shows that current expectations are below average expectations over the last 5 weeks. Investors typically buy when a security's price rises above its moving average and sell when the price falls below its moving average. This has been shown in the following charts.



Moving Average and Stock Prices ***Moving Average and Stock Prices***

Two types of moving averages are used in technical analysis of share prices. These are–

- ***Simple Moving Average (SMA)*** also called arithmatic average in which sum of all the past closing prices over the time period and divides the results by the number of prices used in the calculation. It has been explained above.
- ***Exponential Moving Average (EMA)*** in which more weight is given to the most recent data and less weight is given to the older data. It is more responsive to new information relative to the simple moving average. That is why, it is the choice among many technical traders.

Evaluation : The merit of this type of moving average system (*i.e.* buying and selling when prices penetrate their moving average) is that an investor will always be on the 'right' side of the market– prices cannot rise very much without the price rising above its average

price. The disadvantage is that investor will always buy and sell late. If the trend does not last for a significant period of time, typically twice the length of the moving average, the investor will lose money.

MOVING AVERAGE CONVERGENCE DIVERGENCE (MACD)

MACD is an oscillalor which measures the convergence and divergence between two moving averages and it oscillates around a horizontal reference line. The MACD is calculated by subtracting a 26-day moving average of a security's price from a 12-day moving average of its price. The result is an indicator that oscillates above and below zero.

When the MACD is above zero, it means the 12-day moving average is higher than the 26 day moving average. This is bullish as it shows that current expectations (*i.e.* the 12-day moving average) are more bullish than prevoius expectations (*i.e.* the 26-day average). This implies a bullish, or upward, shifts in the supply or demand lines. When the MACD falls below zero, it means that the 12-day moving average is less than the 26- day moving average, implying a bearish shift in the supply or demand lines.

RELATIVE STRENGTH ANALYSIS

Relative Strength Analysis (RSA) is based on the preposition that in stock market, some shares perform better and some shares perform worse than the market. Some of the shares are able to outperform the market. In rising markets their prices move faster than others and in falling markets, their prices decline slower than others. This gives an idea about the strength of the share. This strength can be measured by–(i) Relative Strength Ratio; (ii) Relative Strength Index.

Relative Strength Ratio

Relative Strength Ratio (RSR) is calculated as the ratio of the stock price to a stock index of overall market or a sectoral index. For examle, ratio may be calculated between the share prices of M&M Ltd. and Sensex or between SBI and Bankex. If the ratio increases over time, it shows that the particular share is outperforming the market or that sector. The relative strength of a share may be considered as its ability to outperform the market at turning points. It arises out of the ability of a share to recover earlier from a bear market or to peak out earlier than the market. It may be noted that the relative strength of a share is at work during rising as well as decreasing markets.

Relative Strength Index

Relative Strength Index (RSI) was developed by Wells Wilder. It is an oscillator used to identify the inherent technical strength and weakness of a particular scrip or market. RSI can be calculated for a scrip by adopting the following formula.

$$RSI = 100 - \left(\frac{100}{1 + RS}\right)$$

$$RS = \frac{\text{Average gain per day}}{\text{Average loss per day}}$$

Avg. g n' days advances / Avg. g n' days decline

The RSI can be calculated for any number of days depending on the wish of the technical analyst and the time frame of trading adopted in a particular stock market. RSI is calculated for 5, 7, 9 and 14 days. If the time period taken for calculation is more, the possibility of getting wrong signals is reduced. Reactionary or sustained rise or fall in the price of the scrip is foretoled by the RSI.

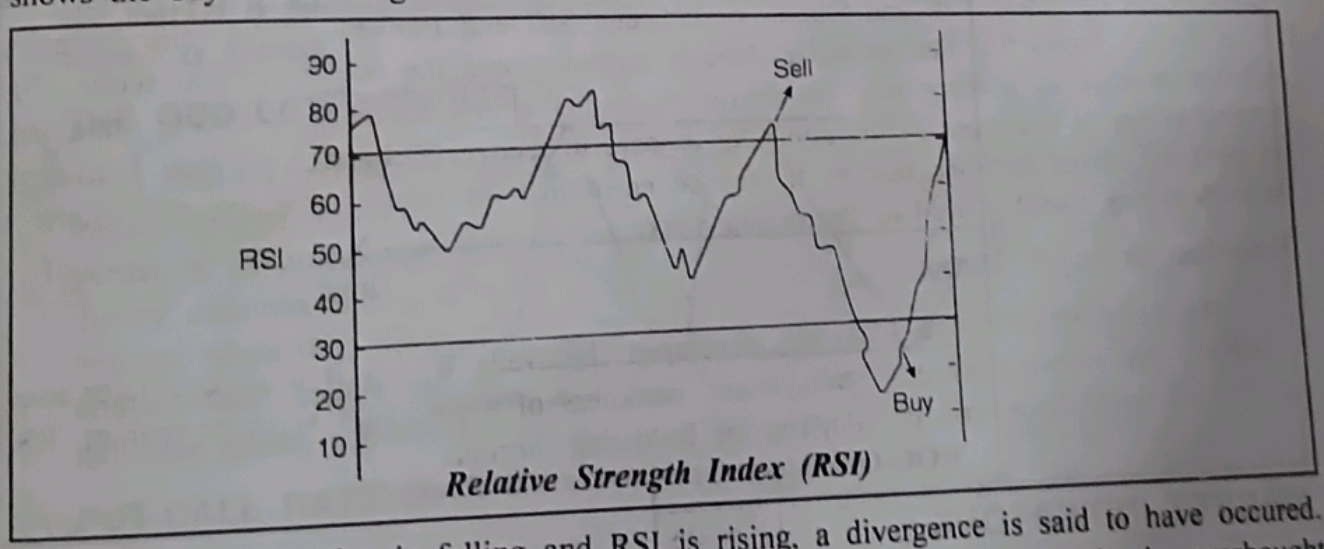
Calculation of Day RSI for REL Ltd. is given below :

Date	*Price*	*Gain*	*Loss*
Sept. 4, 2008	300	–	–
6	304	4	–
7	319	15	–
8	317	–	2
11	319	2	–
12	333	14	–
13	331	–	2
14	332	1	–
18	348	16	–
19	346	–	2
		52/6 = 8.67	6/3 = 2

$$RSI = 100 - \left(\frac{100}{1 + 4.335}\right)$$

$$= 100 - 18.74 = 81.26$$

The broad rule is, if the RSI crosses seventy there may be downtrend and it is time to sell. If the RSI falls below thirty it is time to pick up the scrip. The chart given below shows the buy and sell signals of a RSI chart.



Relative Strength Index (RSI)

If the share price is falling and RSI is rising, a divergence is said to have occured. ***Divergence*** indicates the turning point of the market. If the RSI is rising in the overbought zone, it would indicate the downfall of the price. If RSI falls in the overbought zone, it gives a clear signal of 'sell'. The term ***'overbought'*** describes the price level at which

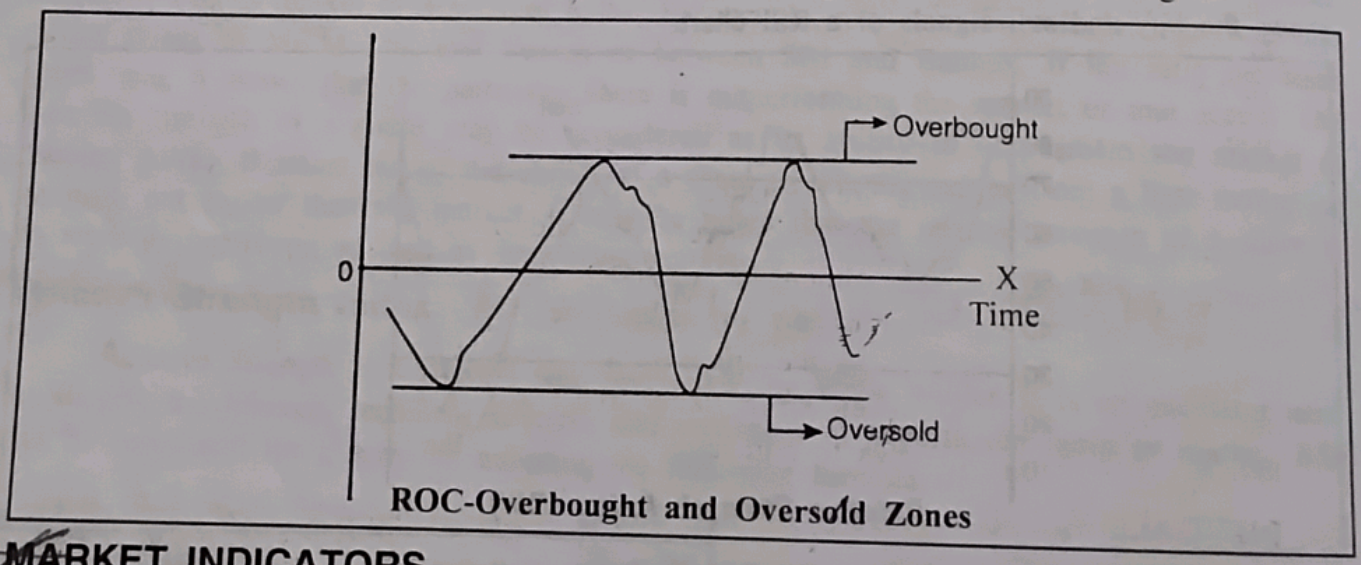
momentum can no longer be maintained and the price has to go down. This condition occurs after a sharp rise in price during a period of heavy buying. When the RSI is in the oversold region, it generates the buy signal. The term oversold is used to describe a security or market that has declined to an unreasonably low level. This condition is characterised by an increase in sales and excess of net declines.

RATE OF CHANGE

Rate of Change (ROC) indicates or measures the rate of change between the current price and the price 'n' number of days in the past. ROC helps to find out the overbought and oversold positions in a scrip. It is also useful in identifying the trend reversal. Closing prices are used to calculate the ROC. Daily closing prices are used for the daily ROC and weekly closing prices for weekly ROC. Calculation of ROC for 12 week or 12 month is most popular.

ROC can be calculated by two methods. In the ***first method***, current closing price is expressed as a percentage of the twelve days or weeks in past. Suppose the price of AB company's share is Rs. 12 and price twelve days ago was Rs. 10 then the ROC is obtained by using the equation: $12/10 \times 100 = 120$ %. In the ***second method***, the percentage variation between the current price and the price twelve days in the past is calculated. It is nothing but $12/10 \times 100—100 = 20\%$. By this method both positive and negative values can be arrived.

The ***main advantage*** of ROC is the identification of overbought and oversold region. The historic high and low values of the ROC should be identified at first to locate the overbought and oversold region. If the scrip's ROC reaches the historic high values, the scrip is in the overbought region and a fall in the value can be anticipated. Likewise, if the scrip's ROC reaches the historic low value, the scrip is in the oversold region, a rise in the scrip's price can be anticipated. Investor can sell the scrip in the overbought region and buy it in the oversold region. The following chart shows the overbought and the oversold region.



ROC-Overbought and Oversold Zones

MARKET INDICATORS

Besides the above discussed indicators, there are certain indicators which are used to analyse the behaviour of the overall market. These are known as market indicators. The overall

market movements affect the individual share price. Hence, aggregate forecasting is considered to be more reliable than the individual forecasting. Some of the market indicators are discussed hereunder.

BREATH OF THE MARKET

The breadth of market is the term often used to study the advances and declines that have occurred in the stock market. Advances mean the number of shares whose prices have increased from the previous day's trading. Declines indicate the number of shares whose prices have fallen from the previous day's trading. This is easy to plot and watch indicator because data are available in all business dailies. ***The net difference between the number of stock advanced and declined during the same period is the breadth of the market.*** A cumulative index of net differences measures the market breadth. The following table gives the breadth of the market.

The Advance/decline can be drawn as a graph. The Advance/decline does not exactly show when a reaction will occur but it indicates that it will occur soon. The Advance/decline is compared with the market index. Generally in a bull market, a bearish signal is given when the Advance/decline begins rising as the Sensex is declining to a new low.

MARKET BREATH INDEX

The market breadth index is a variant of the advance decline ratio. To compute it, we take the net difference between the number of stocks rising and the number of stocks falling, added (or subtracted) to the previous. For example, if in a given week 600 shares advanced, 200 shares declined, and 200 were unchanged, the breadth would be 2[600 – 200)/200]. The figure of each week is added to previous week's figure. These data are then plotted to establish the pattern of movement of advance and declines.

The purpose of the market breadth index is to indicate whether a confirmation of some index has occurred. ***If both the stock index and the market breadth index increase, the market is bullish; when the stock index increase but the breadth index does not, the market is bearish.***

THE ODD LOT RATIO

Odd-lot transactions are measured by odd-lot changes in index. Odd-lots are stock transactions of less than, say, 100 shares. The odd-lot ratio is sometimes referred to as a yardstick of uniformed sentiment or an index of contrary opinion because the odd-lot theory assumes that small buyers or sellers are not very bright especially at tops and bottoms when they need to be the brightest. The odd-lot short ratio theory assumes that the odd-lot short sellers are even more likely to be wrong than odd-lotters in general. This indicator relates odd-lot sales to purchases.

PUT-CALL RATIO

Ratio of put options to call options can be used to measure the strength of the market. A call option gives holder a right to buy the shares at a fixed strike price. In a way, he is an optimist about the market. On the other hand, a put option gives a holder a right to sell the

In the E.M. all the known Inf^n is Immediately Discounted by all the Investors & Reflected in the Security prices in the Mkt.

shares at a fixed strike price. In a way, he is a pessimist. ***The ratio of outstanding put options to outstanding call options is called the put-call ratio.*** A historical put-call ratio may be calculated on the basis of say, last 1 year data. A deviation of the current put-call ratio from the historical ratio may be considered to be a signal of market sentiment. The signal can be used to forecast the market behaviour.

Put-call ratio is generally below 1. For example, if put-call ratio in 0.65, it means that there are 65 put options purchased for very 100 call options purchased. A rise in put-call ratio indicate a pessimism on the part of options speculators. For some analysts, put-call can be used as a contrary indicator. When put-call ratio is increasing and reaches 80 it is excessively bearish. However, it indicates a buy signal. The reason may be that when others are selling, it is time for you to buy. When put-call ratio goes down to 0.30 or so, it shows increasing optimism of the option traders. For a contrarian investor, it is taken as a sell signal.

SHORT SALES POSITION

Short selling is a technical indicator known as short interest. Short sales refer to the selling of shares that are not owned. The bears are the short sellers who sell now in the hope of purchasing at a lower price in the future to make profits. The short sellers have to cover up their positions. Short positions of scrips are published in the business newspapers. When the demand for a particular share increases, the outstanding short positions also increase and it indicates future rise of prices. These indications cannot be exactly correct, but they show the general situations.

Short sales of a particular month is selected and compared with the average daily volume of the preceding month. This ratio shows, how many days of trading it would take to use up total short sales. If the ratio is less than 1, market is said to be weak or overbought and a decline can be expected. The value between 1 and 0.5 shows neutral condition of the market. Values above 1 indicate bullish trend and if it is above 2 the market is said to be oversold. At market tops, short selling is high and at market bottoms short selling is low.

MUTUAL FUND LIQUIDITY

The mutual fund cash position or liquidity can be used to forecast the market behaviour. Mutual funds have emerged an important group of investors in securities. Mutual funds keep investible funds with them to take advantage of the favourable market conditions and opportunities. A low cash position of mutual funds indicates a fully invested position resulting in a low or negligible buying power in their hands. This may be taken to indicate a decline in the market. On the other hand, when mutual funds have large cash positions, it suggests that they are bearish. A contrarian analyst would suggest that market is at a low point and it is the time to buy.

CRITICISM OR WEAKNESSES OF TECHNICAL ANALYSIS

As discussed, there are various tools and techniques of technical analysis which are used to forecast the price behaviour. Various price patterns can be used to predict future prices. Still however, there are several limitations or weaknesses of technical analysis which are as follows:

(1) **Difficult in Interpretation** : Technical analysis is not as simple as it appears to be. While the charts are fascinating to look at, interpreting them correctly is very difficult. It is always easy to interpret the charts long after the actual point of time. As such, charting techniques are no different from palmistry.

(2) **Frequent Changes** : With changes in market, chart patterns keep on changing. Accordingly, technical analysts change their opinions about a particular investment very frequently. One day they put up a buy signal. A couple of weeks later, they see a change pattern and put up a sell signal.

(3) **Unreliable Change** : Changes in market behaviour observed and studied by technical analyst may not always be reliable owing to ignorance or intelligence or manipulative tendencies of some participants.

(4) **False Information** : A false piece of information or wrong judgment may result in trade at a lower than market price. If the technicians fail to wait for confirmation, they incur losses. The market prices of shares are sometimes the results of certain unhealthy practices like cornering and rigging of certain shares by some stock market operators.

(5) **Less Precise Tools** : The greatest limitation of technical analysis is perhaps the mechanical precision it gives to the entire exercise of investment in equity shares. However, the tools are subject to errors, breakdown and misinterpretation.

(6) **No One Indicator is Infallible** : Technical analysis includes many approaches, most requiring a good deal of subjective judgment in applications. A number of tests have been conducted to obtain statistically reliable estimates of the worth of various technical trading strategies. The results have been inconclusive because of different findings of different researchers using different procedures and different samples.

Because of this, technicians seldom rely upon a single indicator; they place reliance upon reinforcement provided by groups of indicators. In nut shell, it can be said that technical analysis is essentially an imperfect science and an art. It helps those who have good skills, of course, not always.

EFFICIENT MARKET THEORY

It is important for investors to understand the market environment in which they compete and in which securiteis are priced. Economicsts have deligently classified markets based on the number of sellers, the nature of competition among them and various permutations of demand-supply conditions. In the mid 1960s Eugene introduced the concept of efficient market to the literature of financial economics. Now, we shall explain (a) how intense competition among analysts leads to market efficiency, as reflected in random and unpredictable price movements and (b) its implications for investment policy.

RANDOM WALK THEORY

Many persons believe that securities market prices can never be predicted, because of inability to identify definite causes for many of the fluctuations in prices. They believe that such fluctuations are mere statistical ups and downs. This belief or hypothesis is known as Random Walk Hypothesis. Random Walk Hypothesis maintains that–

(a) Behaviour of securities prices are unpredictable;

(b) There is no ascertainable relationship between the present prices and future prices; and

(c) Fluctuations in securities prices are statistically independent of the past history. In other words, successive peaks and troughs are unconnected.

Adoption of this theory prohibits the use of any forecasting exercise for predicting the future trend in securities prices. Believers in this theory do not use 'past history' of prices for determining timings for investment. The theory gets its name from the comparison that is established between behaviour pattern of prices, and the way in which a drunken-man may walk in a blind lane. That is why this theory has been termed as random walk theory.

EFFICIENT MARKET HYPOTHESIS

The efficient market hypothesis (EMH) assumes that all publically available information is reflected in the securities prices and it is difficult for an investor to out perform the market. On the other hand, a market is said to be inefficient when there is a time lag between the availability of information and its absorption in the security prices. ***The notion that security prices at a given instant in time reflect all available information is termed as the efficient market hypothesis (EMH).*** Based on the notion of what is meant by the term "all available information". Eugene Fama has suggested that it is useful to distinguish three levels of market efficiency:

(1) ***Weak-from hypothesis*** asserts that prices reflect all information found in the record of past prices, trading volumes, or short sales. The security prices may move randomly and so sure prediction about the future prices of shares can be made on the basis of past or existing prices. The weak form of efficiency discards the technical analysis because if there is no volume of studying past prices and changes then there is no utility of technical analysis.

(2) ***Semi-strong form hypothesis*** asserts that prices reflect all information on price and volume as well as all publically available knowledge (fundamentals) about the company being studied. The semi-strong form supports the view that there is no learning lag among investors. Whenever a new information is generated, all the participants in the market assess the information with equal speed and efficiency.

(3) ***Strong-form hypothesis*** asserts that stock prices reflect all information, in public and private (insider) domain, relevant to the firm. In such a market, no investor would be able to learn abnormal return by using any information because that information is already reflected in the securities price.

IMPLICATIONS FOR INVESTMENT POLICY

To the extent markets are efficient in dissemination of information, trading rules based on price patterns ought to be self-destructing. The random walk school has demonstrated to its own satisfaction that successive price changes over short periods, such as a day, a week, or a month are independent. Further, in truly efficient markets, the fundamentalists can outperform the market only when the analyst has a unique insight into the future of the firm and uses it to reach buy-hold-sell investment decisions.

If markets are working efficiently, neither fundamental analysis nor technical analysis should generate superior or excess profits. Thus, the proponents of the EMH advocate passive as opposed to active investment strategy. The passive strategy involves buying and holding a well diversified portfolio that represents a broad-based market index, without attempting to search out mispriced securities. Does this mean there is no role for rational portfolio management in efficient markets? The essence of rational portfolio management is risk reduction through systematic diversification of portfolio. The risk of the portfolio should be commensurate with the investor's risk preference. However, it is not possible to eliminate the element of subjectivity in this process. Thus, there is no substitute for security analysis. The trick, for the analysst, is to find out firms that are better than the competitors' estimate, reflected by their share prices.

REVIEW QUESTIONS

A. VERY SHORT ANSWER TYPE QUESTIONS

1. What is technical analysis?
2. What do you mean by double tops and bottoms?
3. What are the tools and techniques of technical analysis?
4. What are bar charts?
5. What do you mean by candlestick charts?
6. What are the limitations of charts?
7. Explain 'bid' and 'ask'.
8. What do you mean by breath of the market?
9. What do you mean by market indicators and oscillalors?
10. Differentiate between indicators and oscillalors.
11. What do you mean by Expontential Moving Average?
12. Explain Moving Average Convergence and Divergence (MACD).
13. Explain Relative Strength Index.
14. What is Efficient Market Hypothesis?

B. SHORT ANSWER TYPE QUESTIONS

1. What are the assumptions of technical analysis?
2. Explain the DOW Theory?
3. Distinguish between primary and secondary movements/trends.
4. Explain the Elliott Wave Theory.
5. Distinguish between technical analysis and fundamental analysis.
6. Differentiate between Bar Chart and Candlestick Chart.
7. What is meant by the support level for a share or for a market index?
8. Write a short note on head and shoulders.
9. How would you interprete 'flas and pennauts' formation?
10. Explain 'support and resistance' line with illustration.