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#### CHAPTER - III

# THEORIOTICAL INTRODUCTION TO THE SUBJECT

#### 3.1 INTRODUCTION OF QUANTITATIVE TECHNIQUES :

QUANTITATIVE techniques are the powerful tools through which production can be augumented, profit can be maximised, cost can be minimised and production method can be oriented for the accomplishment of certain predetermined objectives. The study of quantitative techniques is a relatively new discipline which has it's wide range of applications specially in the field of Agriculture and Industry. Of late, there has been a growing tendancy turn to quantitative techniques as a means for solving many of the problems that arise in the business or industrial enterprise. A large number of business problems in the relatively recent past have been given a quantitative representation with considerable degree of success. All this has attracted the students. business executives, public administrators a like towards the study of these techniques, more and more in the present times.

Quantitative techniques are the set of scientific techniques intended to express the business operation in to measurable terms and thereby reduce the deicision making process to a more analytical and more objective process.

#### 3.2 MEANING :

Quantitative techniques are those statistical and operational research or programming techniques which helps in the decision making process specially concerning business and industry. These techniques involves the introduction of elements of quantitatives i.e. they involve the use of numbers, symbols and mathematical expression. The quantitative techniques are essentially helpful and supplement to judgement and intution. These techniques evaluate planning factors and alternatives as and when they arise rather than prescribe courses of action. As such quantitative techniques may be defined as those techniques which provide the decision maker with a systematic and powerful means of analysis and helps, and based on quantitative data in exploring policies for achieving predetermined goals. These techniques are partially relavent to problems of complex business enterprise and industry.

3.3 CLASSIFICATION OF QUANTITATIVE TECHNIQUES :

# CHART

	Statistical Techniques	Programming Techniques
	e T	•••••••••••••••••••••••••••••••••••••••
1.	Models of collection Vdata	1. Linear programming
2.	Classification & Tabulation of collecting data	2. Decision theory
з.	Probability theory and sampling analysis.	3. Theory of Games
4.	Collection, correlation and regression analysis.	<ul> <li>4. Simulation <ul> <li>a) Monte Corto Technique</li> <li>b) Systems Simulation.</li> </ul> </li> </ul>

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- 5. Index numbers
- 6. Time series analysis.
- 7. Intra and Extra polation
- 8. Survey technique and methodology.
- 9. Ratio analysis
- 10.Stati ... cal quality control.
- 11.Analysis of variance
- 12.Statistical inferences and interpretation
- 13.Theory and attributes.

- 5. Queuing and waiting theory.
- 6. Inventory planning and control.
- 7. Network analysis (PERT AND CPM)
- 8. Integrated production model.
- 9. Others
  - a. Non-linear programming
  - b. Dynamic programming
  - c. Search theory
  - d. Data processing etc.

# 3.4 IMPORTANT QUANTITATIVE TECHNIQUES :

Numerous quantitative techniques are available in modern times. They can broadly be put under two groups.

- a) Statistical Techniques
- b) Programming or Operations Techniques.
- a) Statistical Techniques :

Statistical techniques are those techniques which are used in conducting the statistical inquiry concerning a certain phenamenon. They include all the statistical methods beginning from the collection of data till the task of interpretation of the collected data. More clearly the methods of collection of statistical data the technique of classification and tabulation of various statistical measures such as means, standard deviation, coefficient of correlation etc., the technique of analysing and interpretation and finally the task of deriving inferences and judging their reliability as termed as important statistical techniques.

### 1. Probability theory and sampling analysis :

In many studies concerning business problem, the consideration of time and cost lead to examinations of only a few items of the universe. But the items selected should be as representative as possible of the total population. The selection process is called sampling. Samples are of two basic types.

- (a) Probability or random samples are those which are so constructed that every element or item from the total population has equal probability of selection and the limits of probable error in relating result to the whole population are known mathematically in advance.
- (b) Non-probability or purposive sampling are those which are based on the choice of the sector. The probability theory involves the maximisation examination of comparable past events and forecasting of the future events. Typical areas of applications - market research Inventory control, price movement.

# 2. Correlation and Regression Analysis :

Correlation and Regression is another important statistical technique often used in the business and industry.

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Regression analysis examples the past trends of relationship between one variable, e.g. Sales Volume and one or more than one another variables e.g. the advertising expenditure, cost of salesman, correlation analysis measures closeness of such relationships, correlation and regression analysis involves the study of trends of relationship between the variable and others. Typical areas of applications - Sales forecasting and advertising etc.

3. Statistical Quality Control :

Statistical Quality Control involves the study of process capability of the machine so as to make proper selection of the machine for Economic Manufacture, preparation of control chart to identify assignable causes and thereby eliminate or atleast minimize defectives. The technique of statistical quality control is used by almost all the modern manufacturing industries. The technique of statistical quality control is applied through two phases.

- (a) Process control is the application of statistical tools to industry to maintain quality of products.
- (b) Acceptance sampling is the phase of statistical quality control which attempts to decide whether to accept a lot with a desirable quality level or to reject a lot with an underirable quality level on the basis of evidence, provided by inspection of sample drawn at random from the lot.

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### 4. <u>Time Series Analysis</u>:

Through this statistical technique series of data over period of time are analysed as to their chief types of fluctuations such as trends, cyclical, seasonal and the irregular. It is a set of management and engineering technique. Forecasting is a family of technques, time series analysis regression analysis etc. each of which aims to estimate some aspect of the future. Typical applications of time series analysis are - material control, loading and the scheduling, Budgeting etc.

# 5. <u>Index Numbers</u> :

Index numbers is that statistical technique which measures fluctuations in the prices, volume economic activity or other variables over a period of time relative to a base. In present day situation changes in production, consumption, exports, imports, nationa income, cost of living, incidence of crimes, number of road accidence, business failure and very wide variety of ether phenomenon are studied with the help of index numbers are supposed to be parameters which measures the change in the level of phenomenon.

## 6. Analysis of Variance :

Analysis of variance is one of the most powerful tool of statistical analysis is known as analysis of variance. A systematic procedure for analysis of variance developed by R.A. Fishers capable of the fruitful application to a diversity of practical problems. Basically it consist of classifying and cross classifying statistical result and testing whether the means of specified classification differ significantly. For example the output of given process might be cross classified by machines and operators.

# 7. <u>Ratio Analysis</u> :

Ratio Analysis technique as applied to business is a part of whole process of analysis of financial statements of any business or industrial concern to take credit decisions.

### 8. Intrapolation and Extrapolation :

Intrapolation is the statistical technique of estimating under certain assumption the figures missing amongst the given values of the variables itself where as extrapolation provides figures eutside the given data.

### 9. Other Statistical Technique :

Besides the statistical techniques methods above the other statistical techniques which can be used in the different situation. There are some important techniques is that of the analysis and theory of attributes, statistical inferences and interpretation, survey technique and methodology.

#### b) Programming or operations Research Techniques :

Programming techniques are the model building techniques used by decision maker in modern times. They include wide variety of techniques such as Linear Programming theory of games, simulations, Network analysis, queuing theory and many other similar techniques. Important operations Research Techniques often used these days in business and industry are as under :

#### 1. Linear Programming Problem :

Linear Programming is a mathematical technique for determining the optimal allocations of available resources and obtaining a particular objective when there are alternative uses of the resources, money, manpower, material machine and other facilities. The objective in resources allocation may be cost minimisation or universally profit maximisation. The technique of Linear Programming problem is applicable to problem in which the total effectiveness can be expressed as a linear functions of industrial functions allocations and limitations on the resources give rise to linear equities or equalities or inequalities the individual allocations of available resources. Typical applications - Bank, Advertising, manufacturing, Food-mix etc.

### 2. Inventory Control and Planning :

Introduction of a proper inventory control system

helps in keeping the investment in the inventories as low as feasible and yet ensures availability of materials by providing adequate protection against uncertainties of supplies and consumption of materials and allows full advantage of economies of bulk purchases and transportation costs. Such a system in an organisation reduces considerably the chances of going out of stock and at the same time leads to reduction in the inventory levels and release of capital. The latter has direct effect on the profitability of companys business. The basic inventory control problems i) when should an order for the material be placed ? ii) How much should be produced at the beginning.

#### 3. Transportation and Assignment Problem :

One of the earliest applications of the linear programming techniques has been formulation and the solution of the transportation problem as a linear programming problems. The basic transportation problem was originally developed by F.L. HITCHCOCK, in 1941 in his study entitled "A contribution of a products from several sources to nemourous locations ". This is one of the sub class of L.P.P.s in which the objective is to transport various quantities of a single homageneous commodity, that are initially stored at various origins to different destinations in such a way that the total transportation cost is a minimum.

#### 4. Network Analysis - PERT and CPM :

The management of an any organisation envolve the

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efficient allocation of resources.organisation frequently get engaged in the large complex projects. The key to implementing change in many organisation is to determine the detailed activities necessary to complete a particular project, to estimated the resources and time required for each activity to prepared a scheduled of resources required over the life of the proposed projects. to commit the resources available to specified time period and to monitor and to control time cost performance for the projects. Network analysis is a pictorial representation of the interrelationships of all types of activities and has come to forefront for planning, scheduling and controlling the complex projects. The technique involves programme evaluation and review technique (PERT) and critical path method (CPM) which are provide a methodology for planning scheduling and controlling of project, implementation and for answering questions.

# 5. Game Theory :

Many practical rpoblems requires decision making in a competitive situation where there are two or more opposing parties with conflecting interest and where the action of one depends a upon the one taken by the opponent. The basic ideas of the theory of games is about the strategic behaviour of the individual player or decision maker. Each player is considered as having a series of plans and models of behaviour from which he can choose if he has a set of strategy. In other words each player finds in a dynamic environments or a stochastic universe.

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#### 6. Simulation :

Simulation is one of the problem and technique to provides relatively simple methods where analytical technique are either not available or would be overly complex. Simulation is specially useful where uncertainties of data would produce calculation of great and some times possible business complexities. Simulation is a method of solving the decision making problems by designing, constructing and manufulating a model of a real system. It is in fact the process of experimenting on a model of the real system. The process of experimentation with a model usually consist in inserting different inputes values of the decision.

### 7. Queuing and Waiting Theory :

A flow of customers from finite/infinite populations towards the service facility forms a queue (waiting line) on account of lack of capability to serve them all at a time. The queues may be persons waiting at a doctors clinic or at a railway booking office, these may be of machine waiting to be repaired. In the obsence of a perfect balance between the service facilities and the customers waiting is required either of the service facilities or for the customers arrival. Queue (waiting line) stands for a number of customers waiting to be serviced. The queue does not include the customers being serviced. The process or system that performs the services to the customers is termed by service channel or service facility. - 32 -

8. Integrated Production Model :

This technique aims at minimising cost with respect to workforce, production and inventory. This technique is a highly complex one and issued only by big business and industrial units.

#### 9. Other Operations Research Techniques :

In addition to the above stated operations Research Techniques there are several otehr techniques such as Non-Lienear programming, dynamic programming, search theory, the theory of replacement and so on.

# 3.5 ROLE OF QUANTITATIVE TECHNIQUES IN BUSINESS AND INDUSTRY

Quantitative techniques specially operations Research (OR) techniques have gained increasing importance since world war II in the technology of business administration. These techniques greatly helps in tackeling the intricate and complex the problems or modern business and industry. Quantitative Techniques for decision making are in fact example of the use of scientific method of managment. Their role can be well in the field of following heads.

 They provide a tool for scientific analysis. These techniques provides the executives with a more precise description of the causes and effect relationship and risk underlaying the business operations in measurable terms and this eliminates the conventional intuitive and the subjective basis on which management used to formulate their decisions decides ago.

- 2. They provide solution for various Business problem. The Quantitative Techniques are being used in the field of production procurement, marketing and other finance and other allied fields problems like how best can be Managers and Executives allocate the available resources to various products. So that in a given time the profit are maximum or the cost is minimum.
- 3. They enable proper deployment of resources. Quantitative Techniques render valuable help in proper deployment of resources. For example programme Evaluation and Review Technique (PERT) and critical path method (CPM) enables us to determine the earliest and latest times for each of the events and activities and thereby helps in the identification of the critical path.
- 4. They helps in minimising waiting and servicing costs. The waiting line or queuing theory helps the management men in minimising the total waiting and servicing costs. This techniques also analysis the feasibility of adding facilities and thereby helps the business people to take a correct profitable decision.
- 5. They unable the management to decide when to buy and how much to buy ? The main object of the inventory planning is to achieve

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balance between the costs of holding stocks and the benifit from the stock holding.

- 6. They assist in choosing an optimum strategy. Game theory is specially used to determined the optimum strategy in a competitive situation and enable the business to maximise the profit or minimise the losses by adopting optimum strategy.
- 7. They render great helps in optimum resources allocation. Linear Programming technique is used to allocate scare resources in an optimal manner in the problem of scheduling, product mix, and so on. This technique is popularly known and used by modern management in resources allocation and effective optimal assignments.
- 8. They facilitate the process of decision making. Decision theory enables the businessman to select the best course of action when information is given a probabilistic forms.
- 9. Through various Quantitative Techniques management can known the reduction of the integrated business sytems. The integrated production models techniques is used to minimize costs with respect to work force, production and inventory etc.
- 10. Statistical techniques are also great helps to businessman in more than one ways. Some of the statistical techniques are of considerable importance in sales forecasting where as other facilitated comparision between the various phenamena over time. Through UNIT statistical quality control techniques it can be seen UNITED ARY IN THE SARY INTERVALUE.

whether the process is under control or not. If the same is not under control corrective measures can immediately be taken. Sampling theory enable to take decision for entire universe on the basis of sample studies and variation significance test provide an important tools to judge the reliability of inferences draw on the basis of sample studies.

# 3.6 QUANTITATIVE TECHNIQUES AND THEIR FIELD OF APPLICATIONS

Quantitative Techniques are the set of scientific techniques intended to business constraint and the risk underlaying a business operation into measurable terms and thereby reduce the decision making process to a more analytical and a more objective process. And also quantitative techniques are rendering valuable services in the field of the business management. They helps in directing authority in optimum allocations of various limited resources viz., Manpower, machine capacity, money. material and time etc. to different competing opportunities on objective basis for achieving effectively the goal of business unit. They helps the chief executive in brodering management vision and perspective in the choice of different alternative strategies to the decision problems such as forecasting manpower, production capacities and capital requirements and plan for their acquisitions.

Quantitative Techniques embrace many a functional areas for their application. They can be applied in the field of production, Finance, Quality control, maintenance, stores, marketing, personnel and in the allied fields.

- Quantitative techniques are available for their use in the personnel management where they can be used to
  - i) determine optimum manpower planning
  - ii) decide number of persons to be kept an permanent role and the number of <u>persons</u> to be kept as stand by to meet obsenteesm.
  - iii) Study labour turnover rate and accident rate.
    - iv) Find the optimum manner of scheduling and routing of personnel to variety of jobs.
- Quantitative Techniques are also available for application in the production management to -
  - selecting the buklding site for a plant scheduling and controlling its developments and designing its layout.
  - ii) decide the number of machines that can be manned by single operator.
  - iii) study time lost due to various causes, waiting time, hunting time, queue time, transit time etc.
    - iv) decide optimum allocation of jobs to the facilities and the optimum sequence in which job should be performed.
      - v) prepared the least cost scheduled for the different activities of the projects.

- vi) Calculating the optimum product mix
- vii) Locating within the plant and controlling within the movement of required production material finished goods, inventories.
- 3. Quantitative Techniques can be applied in the marketing management to
  - i) determine optimum product mix,
  - ii) determine the least cost route of the transportation of goods from companys different plant to different warehouses.
  - iii) choose between different medias of advertising and bidding strategy.
    - iv) draw sales forecaste
      - v) to optimum allocation of sales budget to direct selling and proportional expenses.
    - vi) the consumers preferences relating to size, colours, packing etc. for the various products as well as to outbid and outwit competitors.
- 4. Quantitative Techniques are also sueful in the financial management to -
  - interpret financial statement of business or industrial concern to have an ideas of its growth potential profitability, financial stability liquidity etc.
  - ii) develop capital investment plans and evaluate the proposal(s) for its (their) viability.
  - iii) determine the optimum equipment replacement policies.
  - iv) working out a profit plan for the firm

- 5. Quantitative techniques can be applied in the maintanance management to -
  - decide optimum stocking policies of different categories of spares
  - ii) predict the useful life of the part replacement of policy of parts.
  - iii) study the average time for which a machine is underbreak down
- Quantitative techniques are available for the quality control to -
  - see whether the manufacturing process is under control and their by identify the presense of assignable cause.
  - ii) measures the natural tolerance of the machine
  - iii) decide at a reduced cost of inspection acceptability or other wise of an incomming lot.

This is not the end Quantitative Techniques have been successfully employed in the material department, Research and Development department. In addition to this Quantitative Techniques provides the business executives such an understanding of the business operations which gives them new insight and capability to determine better solution for decision making problems with great speed competance and confidence.

# 3.7 <u>A QUANTITATIVE APPROACH TO MANAGEMENT</u> DECISION MAKING :

Management science/operations research provides Managers with quantitative basis for decision making and enhances his ability to make long range plans and develop broad strategy. It also aid to the day to day operation of any business public or private. If you were hired as an M/S and O/R specialist you would be expected to observe various decision making environments, define what the problem were, develop models which seeks to solve those problems, select those inputs of data and environmental factors necessary for a solution find the optimum solution to these problems when it is could be found and help impliment this solution. During this entire process you would also be expected to work with and relate to management in a meaningful way.

The following are the different quantitative approaches to Management in decision making.

# 1. Observing the problem environment

This steps can be as simple as visiting the business and listening to a Manager describe a simple inventory problem or as complex as the spending of full year gathering data on production and distribution for an entire output of a manufacturing conglomarate, skills that helps you here are well developed ability to listen familiarity with data gathering and processing operations and ability to distinguish between the problem and its environmental details. - 40 -

#### 2. Analysing and defining the problem

Next you would determine your research objectives, that is you would define the problem by its type and the form of its solution. As a result, you could determine which factors were relevant to the solution and could isolate those under the control of Management, suppose for example a Manager looks at comparative income statements and notes that profits decreased last year.

### 3. Developing a model

Once the project is approved, your next steps is to construct a model which represents, mathematically, the solution you are studying, you can construct models show the relation and interpretention between an action and reaction or between a cause and an effect. Your task is to produce a model which enables you to forcast the effect of factors crucial to the solution of your problem. Models are either econic or symbolic.

#### 4. Selecting appropriate input data

Once you construct an appropriate model you are ready to collect the data required by that model. This information can come from well kept records, from current tests and experiments or even from hunches based on experience obviously, data collection is not a trial steps in the decision making process.

#### 5. Coming up with a solution

Once you have collected and prepared your inputs you can solve the model. Under the conditions represented by the model, the solution provides an answer to the problem you are researching. Often you will simplify your model to facilited a solution. But if you do remember that solution will generally work only under the simplified assumptions of that model.

#### 6. Implimenting the solution

The final steps is to impliment the solution you have found. This steps includes a full explanations of your findings to management and a good bit of efforts on your part to sell them on the solution. If you are not a part of solution you can expect less than optimum implimentation from a behavioral point of view. Here it is important that you specify these conditions under which the solution can be used. Point out any weakness of your underlaying assumptions so that management will know what risks they are taking when the employ your model to generate results. Attempts to set limits within which the results obtained from using the model are valid.

# 3.8 LINEAR PROGRAMMING :

Linear programming is one of the most popular technique of operations research. It is a mathematical technique for allocating scare and limited resources of a firm in an optimum manner. The technique embraces almost every functional area of the business-production, finance, marketing, distribution etc. in every type of industry. It deals with those problems where the objective is either maximisation or minimisation.

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- i) decide on product mix
- ii) side depots or warehouse to minimise cost
   of transportation
- iii) decide least-cost-route of transportation of units from different plants to different warehouses
  - iv) establish optimum assignment of tasks to facilities
    - v) allocate order quantities of an item among different suppliers.

# What linear programming is?

Linear programming is a mathematical technique for finding the best uses of an organisation sources. The adjective linear is used to describe a relationship between two or more variables, a relationship which is directly and precisely proportional. The linear relationship between work hours and output for finding the feasible solution.

### APPLICATIONS OF LINEAR PROGRAMMING :

All organisations have to make decisions about how to allocate their resources and there is no organisation which operates permanently with unlimited resources consequently management must continuously allocate scare resources to achieve the organisational goal.

### 1. Bank application

A bank wants to allocate it's funds to achieve the highest possible return. It must operate within liquidity limits set by regulatory agencies, and it must maintain sufficient flexibility to meet the loans demand of its customers.

#### 2. Advertising application

An advertising agency wants to achieve the best possible exposure for its clients products at the lowest possible advertising cost. There are a dozens possible magazines in which it can advertise each one with different advertising rates and differing readerships.

#### 3. Manufacturing application

A furniture manufacturers wants to maximise its profits. It has definite limits on production time available in its three departments as well as commitments of furniture to customers.

#### 4. Food-mix application

Food Economist in a developing country wants to prepare a high protein food mixture at the lowest possible costs. There are 10 possible integredients from which protein can be extracted and each of these is available in different quantities at different prices.

#### The Simplex Method

The simplex method also called the simplex technique or the simplex algorithm is an iterative processure for solving an linear programming problem in a finite number of sets. The method provides an algorithm which consists in moving from one vertex of the region of feasible solutions to another in such a manner that the value of the objective functions at the succeeding vertex is less than at the proceeding vertex.

### Simplex Algorithm

For the solution of any L.P.P. by simplex algorithm the existance of an initial basic feasible solution is always assumed. The steps for the computation of an optimum solution are as follows :

<u>Step 1</u>: Check whether the objective function of the given L.P.P. is to be maximised or minimised than we convert into a problem of maximizing it by using the result.

Maximum Z = -Minimum (-Z)

<u>Step 2</u>: Check whether all bi (i = 1, 2, ..., m) are non negative. If any one of  $b_i$  is negative then multiply the corresponding inequation of the constraints by -1 so as to get all  $b_i(1, 2, ..., m)$ non negative.

<u>Step 3</u>: Convert all the inequations of the constraints into equations by introducing slack/or surplus variables in the constraints. Put the cost of these variable equal to Zero. <u>Step 4</u>: Obtain an initial basic feasible solution to the problem in the form.  $X_B = B-1$  b and put it in the first column of the simplex table.

<u>Step 5</u>: Compute the net evaluation  $Z_j - C_j$  (J = 1,2,...n) by using the relation.  $Z_j - C_j = C_B Y_j - C_j$ , Examine the sign of  $Z_j - C_j$ . (i) If all  $(Z_j - C_j) \ge 0$  then the initial basic feasible solution  $X_B$  is an optimum basic feasible solution.

(ii) It atleast one  $(Z_j - C_j) \leq 0$  proceed on to the next step. <u>Step 6</u>: If these are more than one negative  $Z_j - C_j$  then choose the most negative of them. Let it be  $Z_r - C_r$  for some J = r <u>Step 7</u>: Compute the ratios  $\frac{X_{B_i}}{Y_{i_r}}$ , Vir > 0, i = 1,2-m

and choose the optimum of them.

<u>Step 8</u> : Convert the leading element to unity by dividing its row by the leading elements itself and all other elements in its column to zeroes by making use of the relations

$$Y_{ij} - \frac{Y_{kj}}{Y_{kr}} Y_{ir}$$

<u>Step 9</u>: Go to step 5 and repeat the computional procedure until either an optimal solution is obtained or there is an indication of an unbounded solution.



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REFORMULATE TH L.P.P. AS A ST MAXIMIZATION USE THEOROMS 3.2 AND 3.7 UPDATE THE SIMP TABLE BY APPROF OPERALIGNS DESIGN A NEW TA REMOVING THE LE VARIABLE FROM T & INTRODUCE THE LE VARIABLE FROM 3.8 USE THEOROM 3.8 USE THEOROM 3.8 USE THEOROM 3.8 CHOOSE THE SMAL RATIO TO THE BA VARIABLE CORRES TO IT, LEAVES TO THE CORRESPONDI VALUES THE CURR BASIC VARIABLE
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3.9 INVENTORY CONTROL & PLANNING :

Inventory in the wider sense, is define as any idle resources of an enterprise or business. It is a physical stock of goods kept for the purpose of future affairs. The firm is generally used to indicate raw materials in process; finished products, packaging spares and others - stocked in order to meet an expected demand or distribution in the future. Though inventory of materials is an idle resources it is not meant for the immediate use - it is almost essential to maintain some inventories for the smooth functioning of an enterprise. Thus for an enterprise an inventory of materials become essential in order to -

- 1. Promote smooth and efficient running of business
- 2. Provide adequate services to the customers
- 3. Take advettage of price discounts by bulk purchasing
- 4. Take advantage of batching and longer production runs
- 5. Services as a buffer in case of delayed deliveries of raw materials and shop rejections
- 6. Provide flexibility to allow changes in the production plants in view of changes in demand
- 7. Make possible economies in transportation, clearing and forwarding changes.

Through the inventories are essential and provide an alternative to production/purchase in future they also mean lock up capital of an enterprise.