

1. What is system?

Answer:

A **System** may be defined as a collection of interacting elements that operate to achieve a predetermined objective. In simple terms, a system may be visualized as a processing unit which receives certain inputs and is urged to act upon them in some desirable fashion to produce outputs with a purpose to optimize some function of input and output. Inputs may be in the form of energy, matter, information, etc. Processing unit may be activated and controlled by men or machines. The output may be in the form of products, services or information and the objective may be to maximize output.

A system is dynamic in nature. A system may have animate or inanimate interacting elements. A thunder storm is an inanimate system whereas a hospital (building) together with its staff and operating conditions is an animate system. In this system, the input is medicines, medical instruments, patients, etc.; the processing unit includes doctors, other staff and machinery; the output is the relief to the patients and the objective is to treat satisfactorily as many patients as possible in a given time.

A few examples of other systems are as under:

(a) A human body is a system with various sub-systems like nervous, blood circulation, breathing, eating and drinking, etc.

(b) An industry is a system with various subsystems like purchase, production, sales, etc.

Classification of Systems:

A system may be

(i) **Mechanistic:**

A mechanistic system is one which though is fully mechanised yet the choice of system composition remains in the hands of human beings. The examples of the mechanistic systems are, dial telephone, guided missiles, space rockets, etc.

(ii) **Quasi-Mechanistic:**

In a quasi-mechanistic system human beings carry out some of the mechanical functions. A fighter plane is a quasi-mechanistic system.

2. Define management? Write its functions

Management is a functional concept and can be defined as "It is an effort for getting things done in order to achieve the predetermined goals of the concern through co-ordination of human and other elements. But, as its scope is so wide it is not easy task to define management. It is correct perspective. The difficulty is mainly due to the fact that the word management is highly concerned with the people. The behaviors and attitude of the people are highly unpredictable and defy all calculations. Besides, management is a growing science and its generalization is thus in the process of development. For this it is very difficult to confirm its subject matter within a tight compartment of a short definition. Thus various Authors, Writers and Economists define management in different ways but main idea of these definitions is more or less similar though differ in their wordings. Economists define management as a factor of production, Sociologists consider management as a group of persons and as per specialists management is a system of authority.

- a) **Planning:** The first function of management is planning. The planning works out in broad outlines the things that need to be done and the methods of doing them in an orderly manner.
- b) **Organizing:** Once the plan is formulated then there is the need for organizing. This is nothing but a structure created to give successful form of all the combined efforts.
- c) **Staffing:** In organizing, the manager seeks to establish position and decide the duties and responsibilities that belong to each one. But in case of staffing, the manager finds the right man for each job, brings and trains the whole staff for this purpose and maintains congenial atmosphere for work.
- d) **Commanding:** Planning and organizing are not sufficient to move the staff into action. For this command is necessary. Command is the starting signal or order to enable the staff member to move into operational activities.
- e) **Directing:** Direction is associated with command. Directions include guidance and supervision of work of the subordinate. Direction is a continuous process and involves making decision giving necessary instruction for work performance.

- f) **Motivating:** Motivation is psychological acts that help the workers to do more work. It is psychological aspect since it is linked to mental state. Motivation is the actuating force, which inspires a worker to put his best in the accomplishment of the task.
- g) **Controlling:** The work of planning, organization, command, direction and motivation if carried into effect smoothly and properly, leaves nothing to be desired for the accomplishment of the objectives.
- h) **Coordinating:** In a large organization, the number of workers and volume of work is large. The jobs of different workers need to be harmonized. This task is performed with the help of Coordination.

3. Determinants of organisational structure, its types advantages and disadvantages

In simple term, 'structure' is the pattern in which various parts or components are interrelated or inter-connected. Thus, organisation structure is the framework that provides a set of relationships among various components or parts of the enterprise.

Organising is a facilitating function and structure is its mechanism. The concept of organisation and its structure, and inter-personal relationships is extremely complex. So, it is desirable to build up a suitable organisation structure which will assist economical and effective attainment of objectives avoiding the complexities as far as possible.

Organisation is a means to an end. Organisation structure is an important means in this respect. Good structure is, therefore, indispensable. Unsound structural framework will seriously impair good business performance and may even destroy it. So, it should be the task of the managers to establish a structure best suited for the enterprise. The structure depends upon the needs of the enterprise.

Determinants of Organization Structure

Objectives and Strategy: Design of structure begins with the identification of organisational objectives. Since an organisation is a goal-oriented system, it is quite legitimate that its goals have decisive role in designing its structure. The goals determine its tasks and strategies. If management makes a significant change in its strategy, the structure will need to be modified to accommodate and support such change.

Environment: Organisation is a system and every system has its boundaries. Beyond the boundaries, there exists external environment which affects not only the formation and functioning of the organisation but also its structure. Environment includes all those economic, social, cultural, political, legal and technological factors which directly or indirectly affect the functioning of the organisation.

Technology: An organisation is a socio-technical system. Technological aspect which refers to the manner in which various activities will be performed, is an important part of organisational structure.

People: Organisations are formed by and operated through people. Large number of people are employed for both managerial and non-managerial jobs and various activities are assigned to them and finally they are put in authority relationships. These people carry some goals, values, perceptions, beliefs and attitudes which have direct reflection on the structure of organisation.

Size: There are several criteria to determine size of an organisation such as number of persons employed, amount of capital invested, volume of turnover, and physical capacity.

Types of organizational structure:

1. Functional Structure: The advantages of functional structure are as under:

- It is easier to organise departments bases on functions and sub-functions.

- It allows giving balanced weightage to the basic functions on which the survival of a firm depends.
- It introduces specialization leading to higher productivity and economical operations.
- It ensures effective utilization of personnel in different departments.

Disadvantages:

- Each department concentrates on a narrow range of activities relating to its function only.
- It may be difficult to achieve coordination between different departments because of their different orientations.
- There may be lack of understanding between different departments. The atmosphere of mistrust may lead to inter-departmental conflicts.
- Decisions are delayed where decision-making involves two or more departments.

Matrix Structure

[Matrix organization](#), also called grid organization, is a hybrid structure combining two complementary structures namely, functional departmentalization with pure project structure. Matrix organization is a two dimensional structure, a combination of pure project structure and the traditional functional departments. Members of particular project team are drawn from the functional departments and are placed under the direction of the project manager. The project manager has overall responsibility for the success of the particular project.

The merits of matrix organization are as under:

- The matrix structure is an efficient means for bringing together the diverse specialized skills required to a complete a complex assignment or execute a project.
- It is flexible in nature. It can be applied more usefully to an organization involved in project ranging from small to large.
- It motivates personnel engaged in the project. They can utilize their competence and make maximum contribution for the execution of the project.
- It helps in improving flow of communication around the organization as required information is communicated both vertically as well as horizontally.

The disadvantages of matrix structure are as follows:

- The matrix organization violates the classical principle of unity command. The personnel from functional department have to face the situation of two bosses, project manager and functional manager.
- In matrix organization, the problem of coordination is more complicated because neither functional head has an authority over project unit in a direct manner nor the project manager has full authority over project activities.
- Matrix organization is not a homogeneous and compact group. The multiplicity of vertical and horizontal relationships may impair organizational efficiency.
- Dual reporting relationship in matrix organization can contribute to indiscipline, ambiguity and role conflict.

Project Organization

The term 'project' may be defined as a complex set of activities which are diverse, specialized and technical to be performed within the given time frame and cost structure. The project structure is designed to handle such set of activities along with the already existing organizational structure.

The merits of project structure are as under:

- Project organization concentrates on completion of a complex project or assignment. It can be tailored to meet the requirements of the particular project.
- Project organization provides greater flexibility in organization; greater check over the project work, provision of determining exact responsibility and better co-ordination of organizational resources.
- Project organization requires specialists in various fields. Specialists get higher satisfaction while working on complex projects.
- It facilitates the timely completion of a project without disturbing the normal activities of the organization.

The limitations of project organization are as under:

- Uncertainty in project structure arises because the project Manager has to deal with specialists from a number of diverse fields. The specialists often have different types of approaches and perspectives.
- Lack of prescribed organizational processes, lack of clearly defined responsibility, lack of communication lines and measurement yardsticks make the job of a project manager often more challenging.
- The project manager has to face a very unusual decision pressure that results from the severe penalties to be imposed because of the delay in completion of the project.
- Motivation of specialists may pose another problem for the project manager. Moreover, there may be conflicts among the specialists quite often because of their different orientations.

Customer Based Structure

Departmentalization by customer may be followed in enterprises engaged in providing specialized services to different classes of customers. Under this, customers are the guide for grouping the activities. The management groups the activities on this basis to cater to the requirements of clearly defined customer groups. For instance, a big automobile servicing enterprise may organize its departments as follows: heavy vehicle servicing division, car servicing division, and scooter servicing division.

The benefits of structure based on customers are as follows:

- Customer departmentalization can focus on the special needs of different kinds of customers.
- It employs personnel with special abilities for meeting different customer requirements.
- It leads to greater satisfaction of customers which enhances the reputation of the enterprise among the public.

Customer based structure is also not free from drawbacks. For instance, it creates the difficulty of co-ordination between the departments organised on this basis and those organised on other bases. Greater emphasis to the need of the customers may lead to less than optimum use of space, equipment and specialized personnel.

Geographical or Territory Based Structure

Geographical structure is followed in case of service organizations which have offices in different regions or geographical areas. Each regional office has independent functional departments to realize its objectives. For instance, [Life insurance Corporation of India \(LIC\)](#) has semi-autonomous divisions in different regions of the country.

Territorial departmentalization has the following advantages:

- It leads to the benefits of local operations. The local managers are more conversant with their needs and those of their customers. They can adapt and respond to the local situations with speed and accuracy.
- The company can meet the demands of various regions more effectively.
- Better attention can be paid to local customer groups thereby raising the image and goodwill of the company. It ensures quick delivery of products to customers in different areas, and intensive exploitation of local markets.
- A regional division can achieve better coordination and supervision of activities in a particular area. It also helps in reducing transportation and distribution costs.

Territorial departmentalization may suffer from the following difficulties:

- There is multiplication of physical facilities. It leads to uneconomical operations.
- There may be problems of integration between various regional offices. They may compete with each other in certain areas.
- There may be lack of talented personnel to take charge of regional departments.
- There will also be problems in providing centralized services to various departments which are located in different regions.

Link: <https://www.mbaknol.com/management-principles/organization-structure/>

4. Explain span of control. Define delegation and decentralization of authority.

While the purpose of organizing is to make human cooperation effective, the reason for levels of organization is the limitations of the span of management. In other words, organization levels exist because there is a limit to the number of persons a manager can supervise effectively, even though this limit varies depending on situations. The relationships between the span of management and the organizational levels are shown in the following figure. A wide span of management is associated with few organizational levels, a narrow span, with many levels.

The process by which authority passes from one managerial level to another is known as delegation. As organisations grow in size and complexity, no one person can perform all the tasks or exercise all the authority that is needed to accomplish goals.

Delegation of authority is not the same as division of work. As Henry Fayol says, "Division of work permits reduction in the number of objects to which attention and effort must be directed and has been recognised as the best means of making use of individuals and of groups of people".

Delegation of authority denotes the superior vesting decision-making power in his subordinate. No one can delegate an authority which he himself does not have.

Delegation is one of the most important skills a manager must possess. The overworked managers are often those who do not know how to delegate. For they lack the skill to get results through others. An individual can perform limited work in a day, all by himself. But through delegation—through dividing his load and sharing his responsibilities with others—he can accomplish much more. No manager and no organisation can run smoothly and effectively without delegation.

5. Discuss factors affecting organizational culture and climate.

Organizational culture is the collection of values, expectations, and practices that guide and inform the actions of all team members. A great culture involves a positive traits that lead to improved performance, while a functional company culture brings out qualities that can hinder even the most successful organizations.

Qualities of a great organizational culture:

Every organization's culture is different, and it's important to retain what makes your company unique. However, the cultures of high-performing organizations consistently reflect certain qualities that you should seek to cultivate:

- **Alignment** comes when the company's objectives and its employees' motivations are all pulling in the same direction. Exceptional organizations work to build continuous alignment to their vision, purpose, and goals.
- **Appreciation** can take many forms: a public kudos, a note of thanks, or a promotion. A culture of appreciation is one in which all team members frequently provide recognition and thanks for the contributions of others.

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- **Trust** is vital to an organization. With a culture of trust, team members can express themselves and rely on others to have their back when they try something new.
- **Performance** is key, as great companies create a culture that means business.
- **Resilience** is a key quality in highly dynamic environments where change is continuous. A resilient culture will teach leaders to watch for and respond to change with ease.
- **Teamwork** encompasses collaboration, communication, and respect between team members. When everyone on the team supports each other, employee will get more done and feel happier while doing it.

6. How does moral related to productivity?

Answer:

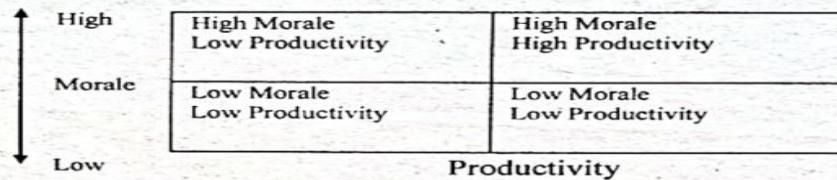


Fig.: Morale and productivity

- **High Morale-High Productivity:** High morale reflects a predisposition to be more productive if proper leadership is provided. This situation is likely to occur when employees are motivated to achieve high performance standards through financial and non financial rewards. Complete identity between individual and organisation goals can lead to this situation.
- **High Morale-Low Productivity:** The situation arises when employees spend their time and energy in satisfying their personal objectives unrelated to the company's goals. Faulty machinery, lack of training, ineffective supervision and restrictive norms of informal groups can also lead to low productivity on the part of employees with high morale.
- **Low Morale-High Productivity:** Low morale cannot result in high productivity for a long period. However, this situation can occur for a temporary period due to fear of loss of job, exceptionally good supervision and machine paced work in which only a part of workers' capabilities are used.
- **Low Morale-Low Productivity:** This is a normal relationship. In the long run low morale is likely to result in low productivity. Low employee morale can hinder a business from achieving organization-wide goals

Thus, there is a complex relationship between morale and productivity. This is because morale is only one of the factors influencing productivity.

7. Mention factor affecting job satisfaction.

Factors affecting job satisfaction are:

1. Working Environment.
2. Fair Policies and Practice.
3. Caring Organization.
4. Appreciation.
5. Pay.
6. Age.
7. Promotion.
8. Feel of Belongings.
9. Initiation and Leadership.
10. Feel of Being Loved.

11. Safety and Security.

12. Challenges.
13. Responsibilities.
14. Creativity in Job.
15. Personal Interest and Hobbies.
16. Respect from Co-Workers.
17. Relationship with Supervisors.
18. Feedback.
19. Flexibility.
20. Nature of Work.

8. Explain briefly factory act and labour laws

Factory act:

1. Working Hours:

According to the provision of working hours of adults, no adult worker shall be required or allowed to work in a factory for more than 48 hours in a week. There should be a weekly holiday.

2. Health:

For protecting the health of workers, the Act lays down that every factory shall be kept clean and all necessary precautions shall be taken in this regard. The factories should have proper drainage system, adequate lighting, ventilation, temperature etc.

Adequate arrangements for drinking water should be made. Sufficient latrine and urinals should be provided at convenient places. These should be easily accessible to workers and must be kept cleaned.

3. Safety:

In order to provide safety to the workers, the Act provides that the machinery should be fenced, no young person shall work at any dangerous machine, in confined spaces, there should be provision for manholes of adequate size so that in case of emergency the workers can escape.

4. Welfare:

For the welfare of the workers, the Act provides that in every factory adequate and suitable facilities for washing should be provided and maintained for the use of workers.

Facilities for storing and drying clothing, facilities for sitting, first-aid appliances, shelters, rest rooms' and lunch rooms, crèches, should be there.

5. Penalties:-

The provisions of The Factories Act, 1948, or any rules made under the Act, or any order given in writing under the Act is violated, it is treated as an offence. The following penalties can be imposed:-

- (a) Imprisonment for a term which may extend to one year;
- (b) Fine which may extend to one lakh rupees; or
- (c) Both fine and imprisonment.

If a worker misuses an appliance related to welfare, safety and health of workers, or in relation to discharge of his duties, he can be imposed a penalty of Rs. 500/-.

Labour Laws:

Building and Other Construction Workers Act, 1996: The purpose of the Act is to collect cess from the construction work and use it for the welfare of the workers on the site.

Contract Labour Act, 1970: The purpose is to control the working conditions of contract labour

Minimum Wages Act, 1948: To give minimum wages to the workers in the organized sector. To empower the government to take steps for fixing minimum wages and to revise wages within 5 years.

9. CPM, PERT, EOQ numericals, LPO, EPO definition

10. What is MRP? How does software package affect MRP?

Answer:

Material requirements planning (MRP) is a production planning, scheduling, and inventory control system used to manage manufacturing processes. Materials Requirement Planning (MRP) was introduced in 1970 as a computerized inventory control system. It helps in knowing the need of raw materials and helps to calculate the demand for a particular item. It takes into account the lead time required to order automatically with the help of software. It helps in tracking the records of the raw materials especially when the materials like raw materials or components parts are required. Basically MRP is an information system which generates automatic results in the area of systematic planning of materials requirement. It is known as computerized ordering and scheduling system for manufacturing. It uses three important input data: bill of materials data, inventory data, and master production schedule to calculate the demand for 3 particular items like raw materials or components parts. Joseph Orlicky, George Plossl and Oliver Wight introduced MRP and popularized this programme. They imparted training for this programme for many years. Many upgraded versions are made available till now. The benefits of MRP are remarkable as it generates work orders and purchase orders automatically. Now in these days MRP-II is available, which is known as Manufacturing Resource Planning.

The following are the Characteristics of MRP:

- i) MRP calculates the demand for components, subassemblies, raw-materials, spare parts.
- ii) MRP helps in systematic planning
- iii) MRP takes into account the lead time required for orders.
- iv) MRP helps in purchase orders planning and tracking
- v) MRP is helpful in preparing production schedules
- vi) MRP ensures materials are available for production and products are available for delivery to customers.
- vii) MRP maintains the lowest possible material and product levels in store.
- viii. MRP is helpful in planning manufacturing activities, delivery schedules and purchasing activities.

11. What is Gantt Chart? Discuss its uses.

A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time. On the left of the chart is a list of the activities and along the top is a suitable time scale. Each activity is represented by a bar; the position and length of the bar reflects the start date, duration and end date of the activity.

Gantt Chart:

A Gantt chart, similar to a bar chart, lists tasks down the left side and elapsed time is marked off across the top. This graphical depiction of the schedule will track the planning and coordination of work that must be completed to produce the defined product. Major task groupings are entered as general areas of work (summary tasks), and then broken down into bodies of work that can be completed independently. Project detail can be added to the smallest increment of definable tasks. As work is completed, the project manager receives updates from each person or resource working, and the plan is updated frequently and then progress is measured against the plan. The Gantt chart reflects the entire schedule of work which might include duration, resources milestones, etc. A Gantt chart can also provide performance and efficiency information that directly impacts reward systems of monetary compensation and promotion.

Uses:

- **Progress monitoring.** [Project managers](#) can see if individual tasks are completed on time and adjust the project schedule. The charts also show which goals were met on schedule, helping managers gauge employee productivity.
- **Project planning.** Managers can set deadlines, milestones and schedules for various project components.
- **Resource management.** Project planners can coordinate [resource allocation](#) with the project schedule. Managers can see the amount of time each process takes and designate resources accordingly.

12. Define bottlenecking. How can it be reduced.

A bottleneck represents a process or operation that has limited capacity and reduces the capacity of the entire production chain. In other words, bottlenecks are unable to process all of the work items quickly enough to get them to the next stage in operation without causing some sort of delay. These delays in production cost money for as long as they are not resolved. They slow down the production process, hinder maximum potential and production, and slow down the facility. This is why it is essential to identify them early.

here are a few ways that you can reduce or contain your bottleneck:

- **Process Work in Batches** – Some operations are able to take less time if they are organized in similar work items in batches. With that being said, it is important to be cautious in the sense that the large batch sizes are always higher risk. Smaller batches are almost always better.
- **Manage WIP Limits** – If the work in progress (WIP) limits are rather liberal in the bottleneck, it may be worth considering lowering the WIP limit. If it doesn't have a WIP limit, then maybe consider setting one.
- **Never Leave It Idle** – Idling can lead to a large percentage of downtime or loss of productivity, which is why the bottleneck process should always be loaded at full capacity. This will enable continuous production and time is never being wasted.
- **Improve Quality** – It is also important to ensure that work arrives in the very best form. Any quality issues can lead to reduced time and ultimately take longer, thus worsening your bottleneck.

13. Discuss the process of VA(Value Analysis)?

Answer:

The value analysis process is normally organized by a value analysis team. It is conducted in the sequential phases. The phases are Problem Identification Phase, Selection of the Members for the Functional Analysis Team, Information Phase, Function Analysis Phase, Creative Phase, Evaluation Phase, Development and Presentation Phase, and Implementation Phase.

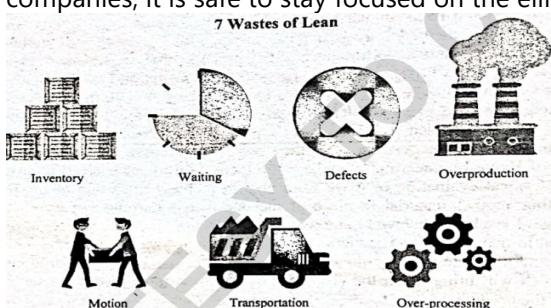
- **Problem Identification Phase:** The first step of the value analysis process is the identification of the problem by the management and preparation for the value analysis. The problem can be complex design of the product and the production cost is high.
- **Selection of the Members for the Functional Analysis Team:** Usually six to eight members from different departments such as materials accounting, production, purchasing, engineering, design and marketing, etc. are selected for further analysis.
- **Information Phase:** This is a very important phase in which the issues are addressed. The targets for improvement and evaluation factors are discussed by the team members. For that purpose, the information from both inside the organisation like present detailed design, materials, manufacturing and marketing information and outside the organisation like the competitors' product designs, information about new technologies, etc. is collected.
- **Function Analysis Phase:** In this phase, first of all the major functions and supporting functions of the product are identified. Further, all parts of the products are dismantle or taken apart to pieces. All the pieces of the products are demonstrated separately.
- **Creative Phase:** The core philosophy of this phase is to emphasis on generation of as many ideas as possible to solve the problem identified in the first phase. During this exercise, no one is going evaluate the ideas as they come. The brainstorming group

for idea generation consists of six to seven experts of different backgrounds. The ideas given by members are listed for evaluation and development of promising ideas to generate a satisfactory solution of the problem.

- **Evaluation Phase:** In this phase, the best ideas for the problem is refined and selected. The idea selected might be to use new materials to adopt a different method of manufacturing, to adopt completely new product, to add on new product functions, to modify the function(s) of the product, to combine the different functions, to eliminate of certain functions. The best idea can be new design, compact design, new packaging, new technology etc. The core of the selection of the best solution for the problem is to lower down the cost.
- **Development and Presentation Phase:** At this stage, the 'best' alternative is developed finally for the presentation to management. Next is the commitment to follow a course of action for initiating the 'best' alternative.
- **Implementation Phase:** In this stage, the final approval of the proposal is obtained from the management and facilitates its implementation.

14. Define waste. How can it be reduced?

In a Lean culture, **waste** is anything that doesn't add value from the customer's perspective. It includes activities that consume resources, add cost to the product or service but contribute zero value to the customer and therefore should be eliminated. **Waste Analysis** is one of the core principles of Lean thinking that involves identifying, quantifying, eliminating and preventing waste. It is also one of the easiest ways an organization can improve its operations. Many Lean concepts and tools focus on continually identifying and eliminating waste. In fact, one of the main objectives of Lean is to remove all forms of waste from the value stream. Much of the focus in Lean and Kaizen is on the identification and the removal of waste, and this waste may exist in the value stream, process or facility. For most companies, it is safe to stay focused on the elimination of waste in the early years of the Lean journey.



1. Transportation

This type of waste is when you move resources (materials), and the movement doesn't add value to the product. Excessive movement of materials can be costly to your business and cause damage to quality. Often, transportation may force you to pay additionally for time, space, and machinery.

Causes are:

- Faulty layout involving cross traffics and backtracking
- Work places spread over large space
- Over production
- Lack of proper material handling equipment
- Insufficient production capacity requiring sub-contract of bottleneck operations
- Excessive rejection/ rework requiring re-routing of parts

- Multi-storeyed storage of material
- Bad housekeeping

Elimination techniques:

- Systematic plant layout
- Method study
- 5S techniques
- Store materials as close to the point of use as possible
- Avoid transporting over long distances
- Eliminate re-handling
- Minimize the need to move materials/parts from main stores to sub-stores
- Automat processes to reduce need for transportation
- Avoid manual handling of heavy materials
- Improve material flow
- Avoid over production
- Improve housekeeping

2. Inventory

Excessive inventory is often the result of a company holding "just in case" inventories. In such cases, companies overstock themselves in order to meet unexpected demand, protect from production delays, low quality, or other problems. However, these excessive inventories often don't meet customer's needs and don't add value. They only increase storage and depreciation costs

Causes:

- Over stocking of materials
- Scheduling errors
- Errors of indenting
- Longer procurement lead time
- Poor control on quantity at receipt stage
- Accumulation of obsolete stock which are not disposed off
- Production/ procurement against faulty forecasts
- Over production

Elimination techniques:

- Dispose off obsolete materials to space up and avoid confusion
- Do not produce based on procrastinated demand
- Produce according to requirements
- Procure in small optimal lots
- Inventory levels should be maintained at optimal limits
- Constitute cross functional teams to measure stocking limits
- Reduce manufacturing and procurement lead times
- Introduce vendor management and SMED systems

3. Motion

This kind of waste includes movements of employees (or machinery), which are complicated and unnecessary. They can cause injuries, extended production time, and more. In other words, do whatever is necessary to arrange a process where workers need to do as little as possible to finish their job.

Causes:

- Unnecessary movement of workmen
- Haphazard plant layout
- Distance of materials and machines
- Searching for materials tools

Elimination techniques:

- Improvement in layout
- Application of motion economy principles
- Effective supervision.
- Reduce unnecessary distance

4. Waiting

This is probably the easiest waste you can recognize. Whenever goods or tasks are not moving, the "waiting waste" occurs. It is easily identifiable because lost time is the most obvious thing you can detect. For example, goods waiting to be delivered, equipment waiting to be fixed, or a document waiting for executives' approval.

Causes:

- Interrupted flow of work from preceding operations
- Unoccupied time of the operator
- Lack of instruction in between jobs
- Delay in movements of raw materials
- Lack of sufficient work
- Faulty allocation of work

Elimination techniques:

- KAIZEN system
- Method study

5. Overproduction

Keeping in mind that waste is anything that the customer is unwilling to pay for, it is easy to realize why overproduction is Muda. Producing more means that you exceed customer's demand, which leads to additional costs. Actually, overproduction triggers the other 6 wastes to appear. The reason is that excess products or tasks require additional transportation, excessive motion, greater waiting time, and so on. Furthermore, if occasionally a defect appears during overproduction, it means your team will need to rework more units.

Causes:

- Production ahead of customer schedule
- Production to built up stocks
- Production to keep employees busy
- Production to utilize excess capacity
- Production to meet contingencies
- Production against advance planning
- Bulk production to reduce setup time
- Excess production due to imbalance in the production line
- Unnecessary production to show higher machine utilization.

Elimination techniques:

- Confirm deliver requirement from marketing
- Strong production planning and control
- Smaller lot size
- Set up time reduction (SMED)
- Improve supplier reliability
- Quality at source

6. Over-processing

This type of waste usually reflects on doing work that doesn't bring additional value, or it brings more value than required. Such things can be adding extra features to a given product that nobody will use, but they increase your business costs. For example, if a car manufacturer decides to put a TV screen in the back trunk of a vehicle, probably nobody will use it or find value in it. Even more, it will cost resources, and it will increase the end price of the product for something that customers are not willing to pay for.

Causes:

- Non value added operations
- Unnecessary closer tolerances and finishes
- Duplication of operations
- Uneconomical raw materials and products
- Poor allocation of work
- Wrong choice of effective methods
- Higher set up time and over production
- Lack of effort and failure to automate work
- Obsolete technology and design
- Frequent changes in job priority

Elimination techniques:

- Method study
- Value analysis
- Simplification
- kaizen

7. Defects

Defects can cause rework, or even worse, they can lead to scrap. Usually, defective work should go back to production again, which costs valuable time. Moreover, in some cases, an extra reworking area is required, which comes with additional exploitation of labor and tools.

As you can see, the 7 types of waste are toxic to your business. However, you can see them more as an opportunity to improve work processes and, most importantly, optimize resources. For different businesses, the 7 forms of waste may have different aspects.

Causes:

- incorrect product design/ design errors
- defective materials r tools
- inadequate maintenance machines
- machine tools try outs
- inefficient processes
- poorly trained employees
- lack of process control

Elimination techniques:

- developing better processes
- design reviewing and improvements
- proper training of employees
- maintenance of machines and equipments.

15. Define cost control and cost reduction. How these can be made effective?

Cost control by management means a search for better and more economical ways of completing each operation. Cost control is simply the prevention of waste within the existing environment. This environment is made up of agreed operating methods for which standards have been developed. Business firms aim at producing the product at the minimum cost. It is necessary in order to achieve the goal of profit maximisation. The success of financial management is judged by the action of the **business executives** in controlling the cost. This has led to the emergence of **cost accounting systems**.

Cost reduction is the process of decreasing a company's expenses to maximize profits. It involves identifying and removing expenditures that do not provide added value to customers while also optimizing processes to improve efficiency. Cost reduction typically focuses on generating short-term savings.

Standard costing and budgetary control are two techniques used in the cost control process. The process is a continuous one and helps to analyse the causes for the variances. It involves:

- Determining the standards
- Comparing the standards and looking at the results
- Analysing the variances
- Establishing the action needed to be taken by the firm

Cost reduction has a significant role in reducing the per unit costs of products and are thus essential for firms to maximise their profits. This process helps in pointing out and reducing the unnecessary expenses during the production process, storage, selling or distribution of the products. The cost reduction process emphasises the following:

- Savings in every unit cost of production
- The product quality should not be compromised
- Non-volatile nature of the savings

16. Explain DARSIRI method with diagram.

a) In Sanskrit, DARSIRI method means “to consider” and also follows similar steps. DARSIRI stands for

D- data collection
A-analysis
R-record ideas
S-speculate
I-investigate
R-recommend
I-implement

- **Data collection:** In this phase all relevant facts or data about a particular troublesome product or part are gathered, organized and analyzed while building cohesion among team members.
- **Analysis:** The judicial analysis phase which means the ideas generated in the creative phase are now refine, select and evaluated the best ideas for development into specific value-improvement recommendations. In other word means that make it to become a practical, pragmatic and analytical mode. Each idea are selected and ranked according to their level of importance.
- **Record ideas:** It's the turn for development phase which determine the “best” alternatives for presentation to the decision-maker. The cost factor is added here and applied to reality. This is a consolidation of what the team thinks.
- **Speculate:** By obtain a commitment to follow a course of action for initiating an alternative. In other words, the proposed changes are put in final form to be presented to the management decision makers. This proposal describes two or three ideas for performing the function of the original, basic and very expensive item with a workable alternative of better value.
- **Investigate:** Take one new idea from the list of ideas that have been initially turned down by management, and with additional sophisticated fine-tuning analysis and description, and present it better in such a way that management can understand and implement.
- **Recommend:** Here the alternative with best outcome is recommended for implementation to the functional areas.
- **Implement:** Here the action plans are implemented into the functional areas for cost control and better value creation.

17. Define PPC. What are its importance and functions.

Production planning and control (PPC) is a necessity for manufacturing facilities around the globe that are seeking to maintain a competitive advantage in the market. PPC is a term used to describe two essential components of manufacturing: production planning and production control.

The production planning portion handles the activities necessary before production actually begins, such as materials planning, capacity planning, and operations scheduling. The production control portion oversees the actual production process by ensuring that the production team is able to meet its production targets and is operating according to schedule. Planning and control are interdependent components that are interrelated to each other. This means that one needs the other in order to work. Planning is a useless tool without having a production control process to take action and ensure that the plan is executed successfully. Production control provides feedback on the accuracy of the production plan, which helps in the modification of existing plans and the creation of future plans. On its end, control is dependent on planning as the standards of performance are laid out during the planning process.

- **Continuous Flow of Production** - One of the primary objectives of production planning and control is the continuous flow of production through the production facility. Continuous flow and process improvement is one of the integral concepts of lean manufacturing, six sigma, and overall production enhancement. Production planning and control will attempt to achieve a smooth and continuous production process by eliminating bottlenecks and waste from your facility, which allows you to take your production to the next level in terms of productivity.
- **Planned Requirements** - The production planning component of production planning and control is essential to ensure that your production facility has what it needs, in the right amount, at the right time. Having a production plan ensures that you have enough material, machines, tools, equipment, and manpower to perform the work.
- **Optimal Inventory Levels** - Inventory is often considered to be wasteful within manufacturing operations. This is because inventory-related costs are some of the largest incurred for many operations. This is why you should aim to reduce inventory levels as much as you can to adequately cut costs within your operations. Production planning

and control plans and executes the processes that allows a consistent flow of production to ultimately come closer to JIT (just-in-time) manufacturing and reducing inventory levels within manufacturing operations.

- **Increased Productivity** - Increased productivity is another substantial objective within production planning and control. Production planning and control ultimately aims to increase productivity through efficiency enhancement while also being economical. Increased productivity is successfully achieved through optimizing the use of existing production resources and labor resources while eliminating wastage/spoilage of materials.
- **Customer Satisfaction** - All companies want to increase customer satisfaction. This is because demand is driven by customers and happy customers means more business in the future. Having defective products and having delays in shipment days will only be harmful to the company. Production planning and control focuses primarily on ensuring that the manufacturing process successfully completes orders on time and reducing lead times. This ensures that customer orders are fulfilled on time and within a short time frame and will improve customer satisfaction with your company.

18. What is production scheduling? Discuss the formal method of production scheduling.

A production schedule lists every single product that'll be manufactured, including where and when they'll be made. It includes every detail, from raw materials to logistics. It also incorporates various processes designed to make production run smoothly while helping managers spot potential issues — like bottlenecks — and stop them before they explode into something bigger. For this reason, it's a flexible, changeable document that you'll need to update and check regularly.

As well as helping managers plan ahead, the production schedule works as a line of communication between production and sales teams. Sales inform the manufacturing team about the levels of demand. Manufacturers then tell sales when the product is ready.

e) Types of Production:

Following are the types of production system

1. **Mass production or flow line production system:** These systems have simplest flow characteristic constituting straight line flow. Facilities are arranged according to the sequence of operations where the output of one stage becomes input to the next stage.
2. **Batch production system:** If a variety of products are made with relatively small volume of production it may not be possible to layout a separate line for each product. In such cases, batch production concept is adopted. When product is made in a certain quantity it is called as "Batch quantity". After a while it is discontinued and another product is scheduled in a certain batch quantity. The various products compete for the share of machine. The machines are for general purposes. Material flow in such systems is more complex than in mass production systems.
3. **Job production system:** A job production does not have its own standard products but accept whatever customer order comes in. Thus it is essentially a group of facilities and processes that meets a wide variety of customer orders in varying batch sizes.
4. **Project production system:** This type of production system generally adopted when there is a huge volume of one work, i.e., a ship production, a construction of a multistoried building or construction of a bridge etc. etc. Generally this system have definite beginning and definite end.

1. **Planning:** Begin with your demand plan. How much raw material will you need, and when? There are two types of planning you can do here: *static and dynamic*. Static assumes nothing will change, whereas dynamic assumes everything could change. Both involve collecting information about resources, timelines, and team availability.
2. **Routing:** Identify where your raw materials will come from and how they'll be delivered to your production or manufacturing team, with a focus on the most cost-effective route.
3. **Scheduling:** Develop a schedule that sets out how you'll meet requirements — including [contingency plans](#).
 - Create a master schedule that encompasses the entire process, from start to finish
 - Set up a manufacturing schedule that covers raw material routing
 - Plan a retail schedule that covers how products move from manufacturing to the shelf or eCommerce store
4. **Communicating:** Share the production schedule to everyone involved and make sure it's understood
5. **Dispatching:** Plot the process of items and people moving around — including when and where throughout the entire process
6. **Execution:** This is the process of putting your plan into action
7. **Maintenance:** Keep your schedule updated regularly as demand changes

19. Explain VED, ABC and Wilson Inventory model

VED analysis is an inventory management technique that classifies inventory based on its functional importance. It categorizes stock under three heads based on its importance and necessity for an organization for production or any of its other activities. VED analysis stands for Vital, Essential, and Desirable.

VITAL	ESSENTIAL	DESIRABLE
<ul style="list-style-type: none"> “Vital” category includes inventory, which is necessary for production or any other process in an organization. If any such inventory is unavailable, entire production may stop. Therefore, order for such inventory should be beforehand. 	<ul style="list-style-type: none"> The essential category includes inventory, which is next to being vital. Loss due to their unavailability may be temporary, or it might be possible to repair the stock item or part. Ensure optimum availability and maintenance. 	<ul style="list-style-type: none"> The desirable category of inventory is the least important among the three. Unavailability may result in minor stoppages in production. Moreover, the easy replenishment of such shortages is possible in a short duration of time.

b) ABC system of inventory control:

‘ABC’ Analysis is a basic tool, which helps the management to place their efforts where the results would be useful to the greatest possible extent. The first important step in inventory management is to have a selective approach to fix-up inventory levels, order quantities, and the extent to which the control can be exercised. The selective approach mainly depends on the annual consumption of various items.

For example, the items like nuts and bolts (though being equally important) cost less than the items like engines. But we cannot safely stock the items like engines because of their heavy cost, while the items like nut-bolts can be easily stocked. Thus, less control is required for stocking the items like nut-bolts etc. But, more emphasis should be given to control the stocking of big items like engines. The investment of such items is substantial, and record keeping is expensive.

ABC (Always Better Control) analysis is a very effective tool for such selective control. This technique involves the classification of inventory items into three categories A, B and C in descending order of annual consumption and annual monetary value of each item. Based on ABC analysis, an average pattern of percentages of items and percentages of their annual consumption value may be planned as below:

Category	Percentage of items (%)	Percentage of Annual Usage (%)
A	10	80
B	20	15
C	0	5

In practice it is experienced that bulks of items in an inventory have low usage value.

Annual usage value = (annual requirement) × per unit cost.

(i) Category ‘A’ items. More costly and valuable items are classified as ‘A’. Such items have large investment but not much a number, e.g., say 10% of items account for 75% of total capital invested in inventory. So, more careful and closer control is needed for such items.

The items of this category should be ordered frequently but in small number. A periodic review policy should be followed to minimize the shortage percentage of such items and top inventory staff should control these items. These items have high carrying cost and frequent orders of smaller size for these items can result in enormous savings.

(ii) Category ‘B’ items. The items having average consumption value are classified as ‘B’. Nearly 15% of the items in an inventory account for 15% for the total investment. These items have less importance than ‘A’ class items, but are much costly to pay more attention on their use. These items cannot be overlooked and required lesser degree of control than those in category ‘A’. Statistical sampling is generally useful to control

(iii) Category ‘C’ items. The items having low consumption value are put in category ‘C’. Nearly 75% of inventory items account only for 10% of the total invested capital. Such items can be stoked at an operative place where people can help themselves with any requisition formality. These items can be charged to an overhead account. In fact, obsolescence and wasteful use, but this will not be so much offset for the saving in recording costs.

Wilson model or EOQ method was created with the clear objective of systematising the goods that are periodically held in the warehouse and defining the quantity and date on which orders must be placed with suppliers.

- Although this system is commonly used to **systematise the purchase of raw materials**, it is applicable to optimising the purchase of any product required by the company provided purchasing costs can be determined in order and storage terms. It is based on the assumption that the **company's demand is known and is independent** and without major fluctuations during the year, so is therefore **constant**.
- The **unit cost of each product or purchase must also fulfil these conditions**, being known and fixed throughout the year. It is not valid therefore for seasonal products.
- **Storage costs** are also known and depend on the level of stock.
- **Potential purchase or order volume discounts are not considered**.
- The supplier's **supply and loading times** are also considered constant and are known.
- It is assumed that **there is no stock depletion and that at any time any product quantity can be requested from the supplier**.

To calculate the model formula, the following terms must be determined:

- **Q: Optimum quantity of each order**
- **K: Cost of each order**
- **D: Annual product or raw material demand**
- **G: Storage cost of each unit**

$$Q = \sqrt{\frac{2KD}{G}}$$

20. Explain store keeping. Discuss various types and application of storage equipment. Mention different methods of codification of store.

In the process of **material control**, after any purchased materials are received and checked, the next step is the storage of materials, also known as **storekeeping**. Store keeping is the task of maintaining safe custody of all items of supplies, raw materials, finished parts, purchased parts, and other items. These items are held in a storeroom for which a storekeeper acts as a trustee. As such, storekeeping can be defined as process of receiving and distributing stores or supplies. In the words of Wheldon, "storekeeping is the physical storage of materials carried into the store-room in a scientific and systematic manner with a view to (i) saving them from all kinds of damages and **losses**, and (ii) exercising overall control over their movement."

In short, storekeeping refers to the art of preserving raw materials, work-in-progress, and finished parts in the stores in the best possible manner.

Generally, in small businesses, storekeeping is a minor task. However, it is always worth remembering that careless handling of materials, material pilferage, and deterioration of materials can lead to reduced profits and even losses. Therefore, to ensure maximum efficiency, it is important to maintain a well-equipped storekeeping department.

Answer:

Codification

Definition: Codification in an industry is the systematic concise representation of equipment, raw materials, tools, spares, supplies, etc. in an abbreviated form complying alphabets, numerals, colors, symbols etc.

Objective of codification:

- a) To classify and codify the items on some logical basis to suit the objective of the organization.
- b) To assist the process of standardization and variety reduction.
- c) To facilitate proper functioning of the store house.
- d) To ensure that each item is kept under one unique code.
- e) To prepare a catalogue – nomenclature list to reduce ambiguity.
- f) To make available the catalogue to all concern dept.

Basic System of Codification

Coding systems adopted by various organization may be classified under—

- 1) Alphabetical.
- 2) Numerical
- 3) Alpha-numerical
- 4) Color coding system

21. Define ERP. Its applications.

Answer:

ERP stands for Enterprise Resource Planning. It is a company-wide computer software system used to integrate the various processes, functions and data and processes of an organization into one single system. This helps the organization to make optimum utilization of management resources and to improve its process efficiency. There are many components of an ERP system, including hardware and software, and these ERP packages are integrated software packages that cater to the needs of almost the entire range of functions of an organization like manufacturing, marketing, quality management, human resources, finance, logistics and many more. Usually ERP systems use a single unified database to store data for various functions found throughout the organization. Enterprise resource planning (ERP) coordinate and manage all the resources, information, and functions of a business from this shared data store. The central feature of an ERP system is a shared database which supports multiple functions used by the different business units of an organization. In simple words, the employees in different departments of a company, say accounting and sales—can rely on one single database for information in accordance to their needs.

The architecture of the ERP system is service-oriented, with modular software and hardware units or "services" which communicate on a LAN. This modular design allows business houses to add/modify or reconfigure modules from different vendors and simultaneously preserving data integrity in one singly shared, centralized or distributed database. ERP is no longer constrained to large companies and many smaller companies are now slowly adapting to the concept for managing their resources properly.

Some of the major features of ERP are as below:

- ERP systems can cover a wide range of organizational functions and processes and integrate them into one single unified database. For example, functions like Manufacturing, Human Resources, Financials, Supply Chain Management, Customer Relations Management, etc. were stand alone software applications once and usually had their own databases and networks. With ERP, they can all be fit under one umbrella.
- ERP bridges the information gap across the organization.
- ERP provides complete integration of Systems not only across the departments in a company but also across the companies under the same management.
- ERP allows automatic introduction of latest technologies like Electronic Fund Transfer (EFT), Electronic Data Interchange (EDI), Internet, Intranet, Video conferencing, E-Commerce, etc.
- ERP eliminates the most of the business problems like Material shortages, Productivity enhancements, Customer service, Cash Management, Inventory problems, Quality problems, prompt delivery etc.
- ERP not only addresses the current requirements of the company but also provides the opportunity of continually improving and refining business processes.
- ERP provides business intelligence tools like Decision Support Systems (DSS), Executive Information System (EIS), Reporting, Data Mining and Early Warning Systems (Robots) for enabling people to make better decisions and thus improve their business processes.

2nd Part:

The benefits of ERP systems are as follows:

- ERP systems help to increase integration/communication between departments starting from order tracking from acceptance through fulfillment and tracking the revenue cycle from invoice through cash receipt.
- For a manufacturing organization, ERP successfully helps in tracking the 3-way task between (what was ordered i.e. the Purchase orders, what has arrived i.e. Inventory receipts and what the vendor has invoiced, i.e. costing).
- ERP helps to decrease the total costs: order processing, material handling, distribution, direct labor, overhead, etc.
- ERP helps in increasing profitability while maintaining product quality and increase value-added relationships.
- Since complete computer security is included within an ERP system, hence protection against cyber crimes like industrial espionage, or embezzlement is expected. ERP security helps to prevent several online abuses as well.
- ERP helps to increase customer service/handle customer expectation.

22. Features of MS Project

There are plenty of features that project managers and their teams need to manage their work better, and MSP has a number of them. However, to get a full picture, here is a list of all features available to customers who put up the big bucks.

- **Grid View:** A project view that is used to plan and manage projects with a task list.
- **Board View:** A visual kanban board view that helps with managing workflow and status.
- **Timeline View:** The traditional Gantt chart used for scheduling tasks over a project timeline.
- **Communication & Collaboration:** Teams can work together on projects.
- **Coauthoring:** Stakeholders and team members work together to edit and update task lists and schedules.
- **Reporting:** Pre-built reports that can track progress, resources, programs and portfolios.
- **Roadmap:** Track programs and project portfolios.
- **Timesheets:** Collect project and non-project time for payroll and invoicing.
- **Resource Management:** Manage resources by requesting and assigning tasks.

23. Define concept and benefits of logistics.

Answer:

Logistics refers to the overall process of managing how resources are acquired, stored, and transported to their final destination. Logistics management involves identifying prospective distributors and suppliers and determining their effectiveness and accessibility. Logistics managers are referred to as logisticians.

"Logistics" was initially a military-based term used in reference to how military personnel obtained, stored, and moved equipment and supplies. The term is now used widely in the business sector, particularly by companies in the manufacturing sectors, to refer to how resources are handled and moved along the supply chain.

Today's world economy is connected through social media and the Internet and has raised customer expectations for faster product delivery. Developing logistics strategies that embrace these expectations requires companies to look at things like the physical location of warehouses and the use of sophisticated software systems to receive purchase requests within a matter of seconds rather than days.

Because customer service satisfaction has become a basis on which companies drive business growth and profitability, using the best transportation system strengthens performance trade-offs to reduce shipping costs and ensure timely delivery of goods. These processes and systems are integral parts of a solid logistics management system, emphasizing the importance of warehousing and transportation for customer service excellence for end-user product delivery.

Logistics within supply chain management is constantly changing to meet consumer demands. Consumers frequently order products using iPods, iPhones, Smartphones, and Tablets expecting to receive their product within 24-48 hours. To meet these expectations, companies have to improve the logistics of their supply chain to expedite order fulfillment and quickly ship the item via the most reliable, yet cost-effective and timely means. When companies create a blueprint that outlines the logistics of the supply chain, each component within that logistics model stays focused, reduces costs and moves quickly and efficiently resulting in higher customer satisfaction. Logistics helps companies understand the key metrics, core processes and long-term goals of their supply chain so they can get the right item to the right place at the right time.

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24. Discuss in brief importance of JIT

MODEL QUESTION

Just-In-Time (JIT) Production

Just-in-time (JIT) is defined as "a philosophy of manufacturing based on planned elimination of all waste and on continuous improvement of productivity". It also has been described as an approach with the objective of producing the right part in the right place at the right time (in other words, "just in time"). Waste results from any activity that adds cost without adding value, such as the unnecessary moving of materials, the accumulation of excess inventory, or the use of faulty production methods that create products requiring subsequent rework.

JIT (also known as *lean production* or *stockless production*) should improve profits and return on investment by reducing inventory levels (increasing the inventory turnover rate), reducing variability, improving product quality, reducing production and delivery lead times, and reducing other costs (such as those associated with machine setup and equipment breakdown). In a JIT system, underutilized (excess) capacity is used instead of buffer inventories to hedge against problems that may arise.

JIT applies primarily to *repetitive manufacturing* processes in which the same products and components are produced over and over again. The general idea is to establish flow processes (even when the facility uses a jobbing or batch process layout) by linking work centers so that there is an even, balanced flow of materials throughout the entire production process, similar to that found in an assembly line. To accomplish this, an attempt is made to reach the goals of driving all inventory buffers toward zero and achieving the ideal lot size of one unit.

The basic elements of JIT were developed by Toyota in the 1950's, and became known as the Toyota Production System (TPS). JIT was well-established in many Japanese factories by the early 1970's. JIT began to be adopted in the U.S. in the 1980's (General Electric was an early adopter), and the JIT/lean concepts are now widely accepted and used.

Answer:

Advantages of Adopting Just-In-Time include:

- Just-in-time approach keeps stock holding costs to a minimum level. The released capacity results in better utilization of space and bears a favourable impact on the insurance premiums and rent that would otherwise be needed to be made.
- The just-in-time approach helps to eliminate waste. Chances of expired or out of date products; do not arise at all.
- As under this management method, only essential stocks which are required for manufacturing are obtained, thus less working capital is required. Under this approach, a minimum re-ordering level is set, and only when that level is reached, order for fresh stocks are made and thus this becomes a boon to inventory management too.
- Due to the abovementioned low level of stocks held, the ROI (Return On Investment) of the organizations be high in general.
- As this approach works on a demand-pull basis, all goods produced would be sold, and thus it includes changes in demand with unanticipated ease. This makes JIT appealing today, where the market demand is fickle and somewhat volatile.
- JIT emphasizes the 'right-first-time' concept, so that rework costs and the cost of inspection is minimized.
- By following JIT greater efficiency and High-quality products can be derived.
- Better relationships are fostered along the production chain under a JIT system.
- Higher customer satisfaction due to continuous communication with the customer.
- Just In Time adoption result in the elimination of overproduction.