

PRODUCTION MANAGEMENT

SECTION-A

1. Meaning of production Management

Production management deals with converting raw materials into finished goods or products. ... It is also called "Production Function."

2. Define Production Management.

According to Elwood spencer Buffa "production management deals with decision making related to production processes so that the resulting goods or services is produced according to specification, in the amount and by the schedule demanded and at minimum cost"

3. Meaning of production planning

Production planning is the **planning of production and manufacturing** modules in a company or industry. It utilizes the resource allocation of activities of employees, materials and **production** capacity, in order to serve different customers.

4. Types of production

1. Advanced scheduling and planning
2. Capacity planning
3. Master production schedule

5. What is plant Location?

Plant location refers to the choice of the region where men, materials, money, machinery and equipment are brought together for setting up a business or factory. ... While taking plant location decision organizations need to consider various factors such as availability of men, materials, money, machinery and equipment.

6. Meaning of work measurement

Work measurement is the application of techniques which is designed to establish the time for an average worker to carry out a specified manufacturing task at a defined level of performance.

7. Different Studying Methods

1. The Classic Note Taking. This one is a personal favourite. ...
2. The Verbal Encoding. Some people are much more vocal in their **studying**. ...
3. The Auditory Approach. ...
4. The Buddy System. ...
5. The Visual Approach.

8. Production Control

The production control is the function of management which plans, directs and controls the material supply and processing activities of an enterprise so that specified products are produced by specified methods to meet an approved sales programme.

9. Quality Control

A system of maintaining standards in manufactured products by testing a sample of the output against the specification.

10. AGMARK

It is a certification mark employed on agricultural products in India, assuring that they conform to a set of standards approved by the Directorate of Marketing and Inspection, an agency of the Government of India.

11. ISI

The mark certifies that a product conforms to an Indian standard (IS) developed by the Bureau of Indian Standards (BIS), the national standards body of India.[1] The ISI mark is by far the most recognised certification mark in the Indian subcontinent.

12. ISO

ISO certification certifies that a management system, manufacturing process, service, or documentation procedure has all the requirements for standardization and quality assurance.
... ISO standards are in place to ensure consistency

13. Material Management.

Materials Management is the planning, directing, controlling and coordinating those activities which are concerned with materials and inventory requirements, from the point of their inception to their introduction into the manufacturing process.

14. Storekeeping

It is a specialized and important function of material control that is especially concerned with the materials and material related goods. The storekeeper is responsible for safeguarding and keeping the materials and supplies in proper places until required in production.

15. Trademark

A trademark (also written trade mark or trade-mark) is a type of intellectual property consisting of a recognizable sign, design, or expression which identifies products or services of a particular source from those of others, although trademarks used to identify services are usually called service marks.

SECTION-B

1.Importance of Production Management

The importance of production management to the business firm:

1. **Accomplishment of firm's objectives** : Production management helps the business firm to achieve all its objectives. It produces products, which satisfy the customers' needs and wants. So, the firm will increase its sales. This will help it to achieve its objectives.
 2. **Reputation, Goodwill and Image** : Production management helps the firm to satisfy its customers. This increases the firms reputation, goodwill and image. A good image helps the firm to expand and grow.
 3. **Helps to introduce new products** : Production management helps to introduce new products in the market. It conducts Research and development (R&D). This helps the firm to develop newer and better quality products. These products are successful in the market because they give full satisfaction to the customers.
 4. **Supports other functional areas** : Production management supports other functional areas in an organisation, such as marketing, finance, and personnel. The marketing department will find it easier to sell good-quality products, and the finance department will get more funds due to increase in sales. It will also get more loans and share capital for expansion and modernisation. The personnel department will be able to manage the human resources effectively due to the better performance of the production department.
 5. **Helps to face competition** : Production management helps the firm to face competition in the market. This is because production management produces products of right quantity, right quality, right price and at the right time. These products are delivered to the customers as per their requirements.
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2.Objectives of Work Measurement:

1. To compare the times of performance by alternative method.
2. To enable realistic schedule of work to be prepared.
3. To arrive at a realistic and fair incentive scheme.
4. To analyse the activities for doing a job with the view to reduce or eliminate unnecessary jobs.
5. To minimise the human effort.

6. To assist in the organisation of labour by daily comparing the actual time with that of target time.

3.Objectives of Production Control

1. Issuing the necessary orders to the proper personnel through the prescribed channels for effecting the plan.

2. To ensure availability of the means of carrying out the orders — the materials, machines, tools, equipment and manpower — in the required quality at the required time.

3. To ensure carrying out of the orders by the personnel so that goods are produced in the required quantities of the specified quality at the pre-determined time. Thus, the underlying principle of production control is that the highest efficiency in production is obtained by producing the required in time and in the best and cheapest method possible.

4.Functions involved in Production Control

Following factors are involved in the practice of production control:

1. Control Activities

This is done by releasing manufacturing orders through dispatching. Thus, plans are set in motion at the assigned time.

2. Control of Material Movement

The time at which material is received from the supplier, and issued to the plant is observed and a close watch is kept on its movement from one plant to another to ensure that this movement is in accordance with the production cost.

3. Availability of Tools is Controlled

Steps are to be taken to ensure that tools specified in the production plan are available as and when required.

4. Quantity Produced is Controlled

Work-in-process at pre-determined stages of production is observed to determine that right quantity of specified quality work is processed.

5. Control of Replacement

Quantity of raw material and work-in-process which fails to pass each stage of inspection is observed. Provision is made to issue replacement orders for each material for work.

6. Labour Efficiency and Control

Time taken on each unit of work-in-process is observed and recorded. Comparison of time taken is made with the time allowed in scheduling

5.Requirements of Production Control System

A good and effective production-control system requires sound organizational structure, reliable information, a relatively high degree of standardization and trained personnel for its success. Factors that are needed to make production control successful are summarized below:

1. Information about Requirements and Productive Capacities

- Complete knowledge of the products to be produced.
- Detailed information about the number and types of each machine and processing unit together with the complete tabulated data on power, speed, and feeds of all machines.
- Detailed information about the time and sequence of operations for each part of the final product and for the finished product as a whole.

2. The following should Conform to Scientifically Determined Standards

- Fabricated and purchased materials
- Tools and equipment, to the extent possible
- Operations on all parts as per design and procedure only

3. The Best Organization Structure Set up

support from the top management with recognition of the need for production planning followed by delegation of their authority with fixed responsibility. Secondly, full understanding on the part of the supervisory staff that the determination of their work-schedule from the central planning room is just an extension of the principles and in no way amounts to erosion of the prestige and power.

4. Availability of Suitable Personnel

- Personnel should understand the scheduled operations.
 - They should be fully trained to fit into the requirements of the particular system adopted.
 - They should be properly remunerated to enlist their interest.
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6 Objectives of Material Management

The fundamental objectives of the Materials Management function ,often called the famous 5 Rules of Materials Management, are acquisition of materials and services : of the right quality, in the right quantity,at the right time,from the right source,at the right price

The key objectives of MM are :

To buy at the lowest price , consistent with desired quality and service

To maintain a high inventory turnover , by reducing excess storage , carrying costs and inventory losses occurring due to deteriorations , obsolescence and pilferage

To maintain continuity of supply , preventing interruption of the flow of materials and services to users

To maintain the specified material quality level and a consistency of quality which permits efficient and effective operation

To develop reliable alternate sources of supply to promote a competitive atmosphere in performance and pricing

To minimize the overall cost of acquisition by improving the efficiency of operations and procedures

To hire, develop, motivate and train personnel and to provide a reservoir of talent

7 Objectives Of Store Keeping

An efficient system of store keeping has the following objects:

- To ensure uninterrupted supply of materials and stores without delay to various production and service departments of the organization.
 - To prevent over-stocking and under-stocking of materials.
 - To check in all materials as to quality and quantity.
 - To minimize storage cost.
 - To ensure proper and continuous control over materials.
 - To ensure most effective utilization of available storage space and workers engaged in the process of store-keeping.
 - To protect materials from loss and wastage due to defective storage.
 - To identify and locate materials in the store-rooms without delay.
 - To protect and safeguard material items against pilferage, theft and fire etc.
 - To develop such a system so that fullest information about store items is available in the stores at every time.
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8. Factors Affecting Plant Location

- Law and order situation,
 - Availability of infrastructure facilities,
 - Good industrial relations,
 - Availability of skilled workforce,
 - Social infrastructure,
 - Investor friendly attitude,
 - **Nearness** to market,
 - **Nearness** to raw-materials' source
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9. Plant Layout and its Types

Plant layout ideally involves allocation of space and arrangement of equipment in such a manner that overall operating costs are minimized”.

The following are the major types of plant layout.

- Process layout/ functional layout/ job shop layout.
- Product layout/ line processing layout/ flow line layout.
- Fixed-position layout/ static layout.

- Combination layout/ hybrid layout.
 - Cellular manufacturing layout.
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10. Procedure involved in Method Study

Method study is the process of subjecting work to systematic, critical scrutiny to make it more effective and/or more efficient. It is one of the keys to achieving productivity improvement.

The process is often seen as a linear, described by its main steps of:

- Select (the work to be studied);
 - Record (all relevant information about that work);
 - Examine (the recorded information);
 - Develop (an improved way of doing things);
 - Install (the new method as standard practice);
 - Maintain (the new standard proactive).
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11. Purchasing procedure of Material Management

- Determining Purchase Budget: ...
 - Receipt of Purchase Requisition: ...
 - Determining Sources of Supply: ...
 - Placing Order: ...
 - Follow-Up of Purchase Order: ...
 - Receipt and Inspection of Materials: ...
 - Checking Invoices
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12. Objectives of Plant Maintenance:

Plant maintenance is defined as a set of activities that are necessary to keep machinery, parts & types of equipment in good operating conditions to avoid production stoppage and loss. Objectives of maintenance management. To reduce loss due to the production stoppage.

(i) The objective of plant maintenance is to achieve minimum breakdown and to keep the plant in good working condition at the lowest possible cost.

ii) Machines and other facilities should be kept in such a condition which permits them to be used at their optimum (profit making) capacity without any interruption or hindrance.

(iii) Maintenance division of the factory ensures the availability of the machines, buildings and services required by other sections of the factory for the performance of their functions

at optimum return on investment whether this investment be in material, machinery or personnel.

13.Types of Plant Maintenance:

Maintenance may be classified into following categories:

- (a) Corrective or breakdown maintenance,
 - (b) Scheduled maintenance,
 - (c) Preventive maintenance, and
 - (d) Predictive maintenance.
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14. Scope of Production Management:

The objectives of production management are aimed at satisfying the needs of the customers through offering organisations products/services. The scope of production management can be considered from the point of view of both strategic decisions influencing the production system and at the operation level. The strategic level decisions are mainly concerned with the design of product and production system. These decisions involve decisions, which have long terms implications

15.Write short notes on Design of Material Handling System &Capacity planning

Design of Material Handling System

As per the principle of Material handling, the handling should be kept at minimum though it is not possible to avoid handling. The selection of particular flow pattern and material handling equipment is dependent on the distance between the workstations, intensity of flow or traffic and size, shape and nature of materials to be handled.

Capacity Planning:

This decision is concerned with the procurement of fixed assets like plant and machineries. The decision regarding the size of the plant, output are decided at this stage. The capacity planning activity is again a function of volume of demand. The operational level decisions are short term decisions. These are mainly concerned with planning and control of production activities

SECTION-C

1.Procedure for Motion Study:

Motion Study can be performed in the following steps:

Step I: Break up the operation of the job:

The first step is to prepare a detailed list of all operations in the present method of manufacturing the job. All details such as material handling, machine work and hand work are included in the list. This may be done with the help of a process chart or diagrams of motion and film analysis or models etc.

Step II: Question each detail of the job:

Questions should be asked on himself by the motion study engineer about the way in which these operations are to be performed, and about the tools and equipment's needed. The procedure of this questioning is known as "Critical Examination".

Questions are asked on the following five points:

- i) Purpose:
- ii) Place:
- iii) Sequence:
- iv) Person:
- v) Means:

Step III: Develop a new method:

After considering the above questions a new better method is developed.

Before finalising the new method the following facts should also be thought over during the motion study:

- i) Elimination Every operation of the job should be thought and whether it can be eliminated without any harm.
- ii) Combine: In this context it is to be observed that whether two or more can be combined to save operation time.
- iii) Rearrangement: If the rearrangement in the sequence of operations helps in simplification or in any other aspect that it should be done.

Step IV: Installing the new method:

Install the new method as a standard practice. For installing the new method, the following procedure is followed: i. The new method must get the approval from the supervisors,

workers and management. ii. Then the workers must be trained to work according to the new method.iii. Observe the installed method until it runs satisfactory.

Step V: Maintain the new method:

After implementation, care should be taken to maintain it to avoid unauthorised change in the method. For maintaining the new method the following steps are advised: a) A job instruction sheet should be given to the worker. b) Scheduled checks should be done to compare what is actually being done against the job instruction sheet. c) Selection and training of persons must be done according to the job specifications for this new method.

2. Explain the Work Study Procedure in Detail.

Work Study Procedure

Work-study is a procedure oriented and systematic study to establish the one best way (standard) method of doing an operation by investigation and analysis of all the details regarding the job or operation carried out as per the established standard method.

Steps Involved in Work Study

1. SELECT Job or Process to be studied;
2. RECORD all the details concerning job using various recording techniques;
3. EXAMINE recorded facts critically by asking questions like who, what, when, why;
4. DEVELOP most economical method;
5. MEASURE the amount of work involved and set standard time to do that job;
6. DEFINE new method and standard time;
7. INSTALL the new method as a standard practice;

Importance of Work Study

- Work study is a means of enhancing the production efficiency (productivity) of the firm by elimination of waste and unnecessary operations.
 - It is a technique to identify non-value adding operations by investigation of all the factors affecting the job.
 - It is the only accurate and systematic procedure oriented technique to establish time standards.
 - It is going to contribute to the profit as the savings will start immediately and continue throughout the life of the product.
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3. Explain the types of Production.

There are 4 different types of productions which are most commonly used. Which type of production should be used by the company depends on the type of product being

manufactured, the demand of the product as well as the supply of raw materials. Taking these factors into consideration, below are the 4 types of Production.

1) Unit or Job type of production

This type of production is most commonly observed when you produce one single unit of a product. A typical example of the same will be tailored outfits which are made just for you or a cake which is made just like you want it.

Example of Unit type of production

It is one of the most common types of products used because it is generally used by small businesses like restaurants, individual products providers or individual services providers

2) Batch type of Production

It is one of the types of production most commonly used in consumer durables, FMCG or other such industries where there are large variety of products with variable demands. Batch production takes place in batches. The manufacturer already knows the number of units he needs to a manufacturer and they are manufactured in one batch.

So, if a manufacturer has the shortage of Product X and 100 units of this product is consumed in one month, then the manufacturer can give orders for batch production of 100 units of Product X.

3) Mass Production or Flow production

One of the best examples of mass production is the manufacturing process adopted by Ford. Mass production is also known as flow production or assembly line production. It is one of the most common types of products used in the automobile industry and is also used in industries where continuous production is required.

An Assembly line or mass production plant typically focus on specialization. There are multiple workstations installed and the assembly line goes through all the workstations turn by turn. The work is done in a specialized manner and each workstation is responsible for one single type of work.

4) Continuous production or Process production

There is a lot of confusion between mass production and continuous production. It can be differentiated by a single element. The amount of mechanical work involved. In Mass production, both machines and humans work in tandem. However, in continuous production, most of the work is done by machines rather than humans. In continuous production, the production is continuous, 24×7 hours, all days in a year.

4. Characteristics of Efficient Plant Layout

Plant Layout is one of the most important factors for a new industrial enterprise, after deciding the location of the plant. It pertains to planning of the space available for all the activities and facilities associated with manufacturing with a view to enable the plant to function effectively.

The designing of a plant layout should be such that it should maximize the return and minimize the cost of production. The following are the characteristics of a plant layout.

1. Smooth flow of production

Plant layout should be in such a way that there must be a smooth flow of production. Raw materials and workers must have access to each machine without any difficulty and delay.

2. Maximum utilization of available space

An efficient plant layout must be such that may utilize the maximum of the space available.

3. Facilities the movement of men, materials and machines, etc.

There must be sufficient space left in between different machines so that raw materials, workers and machines move very easily from one place to another, without the fear of accident.

4. Involves minimum handling

The various machines in a good layout must be arranged in such a manner that the product of one operation may pass on to the next operation with a minimum of handling. It will reduce wastage of raw materials and labour hours.

5. Provides better working conditions

A good plant layout must have facilities such as water, ventilation, retiring room, etc., in the plant. It should also safeguard the health of the workers.

6. Flexibility

A good layout must be flexible enough so as to incorporate any change in the management policies. It must be capable of incorporating, without major change, new equipment to meet technological progress, or increased production requirement or to eliminate waste.

7. Location of stores

The stores in a plant must be located in such a place from where raw materials, tools, equipment and other materials may be supplied to the departments concerned easily, without any delay.

8. Facilitates supervision and control

The position of workers must be arranged in such a way that it facilitates supervision, coordination and control.

9. Provision of safety

There must be complete safety for workers engaged on a machine. Necessary instructions must be given to them about the risks involved while working in certain type of machines. Provisions of Factories Act must be followed in real spirit.

10. Co-ordination and integration

If the plant layout is efficient enough, it is possible to achieve maximum with coordination and integration among men, machines and materials.

5. Various techniques of work measurement are:

1. Time study (stop watch technique),
2. Synthesis,
3. Work sampling,
4. Predetermined motion and time study,
5. Analytical estimating.

Time study and work sampling involve direct observation and the remaining are data based and analytical in nature.

1. Time study: A work measurement technique for recording the times and rates of working for the elements of a specified job carried out under specified conditions and for analysing the data so as to determine the time necessary for carrying out the job at the defined level of performance. In other words measuring the time through stop watch is called time study.

2. Synthetic data: A work measurement technique for building up the time for a job or parts of the job at a defined level of performance by totalling element times obtained previously from time studies on other jobs containing the elements concerned or from synthetic data.

3. Work sampling: A technique in which a large number of observations are made over a period of time of one or group of machines, processes or workers. Each observation records what is happening at that instant and the percentage of observations recorded for a particular activity, or delay, is a measure of the percentage of time during which that activities delay occurs.

4. Predetermined motion time study (PMTS): A work measurement technique whereby times established for basic human motions (classified according to the nature of the motion and conditions under which it is made) are used to build up the time for a job at the defined level of performance. The most commonly used PMTS is known as Methods Time Measurement (MTM).

5. Analytical estimating: A work measurement technique, being a development of estimating, whereby the time required to carry out elements of a job at a defined level of performance is estimated partly from knowledge and practical experience of the elements concerned and partly from synthetic data.

6. Stages of Production , Planning and Control

Production planning is a strategy to plan a chain of operations that supports manufacturers to be at the right place, at the right time so that they can achieve the maximum efficiency from their resources., there are four stages or essential elements in the process of production planning and control. These are as follows:

1. Routing

Routing determines the path from which the raw materials flow within the factory. Once, the sequence is followed, raw materials are transformed into finished goods.

Setting up time for every step is important to measure the overall duration of the production process. Simply saying, routing in manufacturing states the sequence of work and operations. Routing throws light on the quantity and quality of materials to be used, resources involved (men, machine, and material), the series of operations and place of production.

Routing manages “How”, “What”, “How much”, & “Where” to produce in a manufacturing company. It systematizes the process and nurtures optimum utilization of resources to get the best results.

2. Scheduling

Scheduling is the second step that emphasizes on “When” the operation will be completed. It aims to make the most of the time given for completion of the operation.

As per Kimball and Kimball, scheduling is defined as –

“The determination of the time that should be required to perform the entire series as routed, making allowance for all factors concerned.”

Organizations use different types of schedules to manage the time element. These include Master Schedule, Operation Schedule, Daily Schedule and more.

3. Dispatching

The third step ensures that operations are done successfully and everything is loaded on the software. Dispatching includes the release of orders, in accordance with the scheduled charts.

Here are the points that encapsulate “Dispatching”

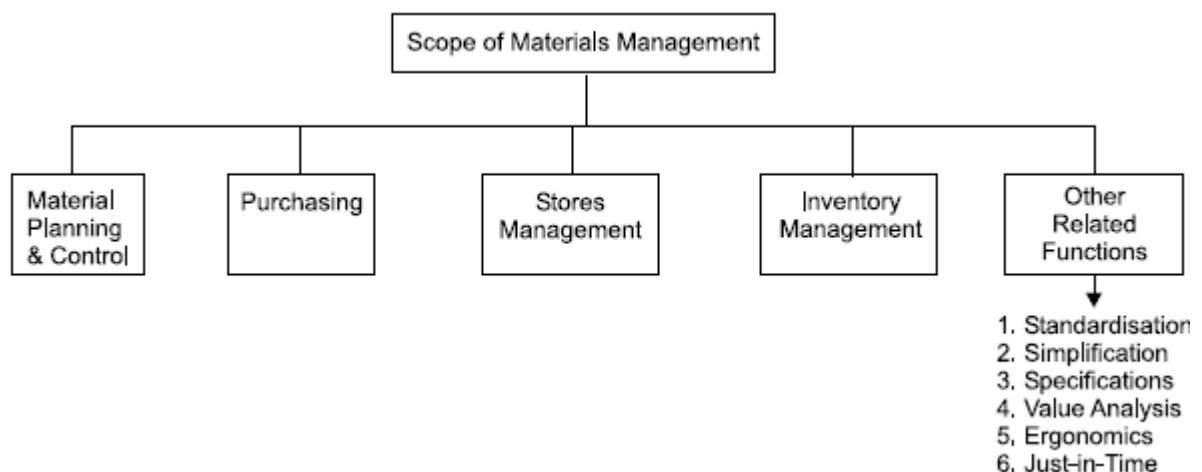
- Issue of materials or fixtures that are important for the production
- Issue of orders or drawings for initiating the work
- Maintain the records from start to end
- Initiate the control procedure
- Cascade the work from one process to another.

4. Follow-up

Also known as expediting, follow-up is the final step that finds faults or defects, bottlenecks and loopholes in the entire production process. In this step, the team measures the actual performance from start till the end and then compares it with the expected one.

Expeditors or stock chasers are responsible for performing follow-up process. It is quite obvious that any of the processes may undergo break-downs or machine failure. Follow-up promotes smooth production by eliminating these defects.

7.Scope of Material Management



1.Materials planning and control:

Based on the sales forecast and production plans, materials planning and control is done. This involves estimating the individual requirements of parts, preparing materials budget, forecasting the levels of inventories, scheduling the orders and monitoring the performance in relation to production and sales.

2.Purchasing:

This includes the selection of sources of supply finalization in terms of purchase, placement of purchase orders, follow-up, maintenance of smooth relations with suppliers, approval of payments to suppliers, evaluating and rating suppliers.

3.Stores management or management:

This involves physical control of materials, preservation of stores, minimization of obsolescence and damage through timely disposal and efficient handling, maintenance of store records, proper location and stocking. A store is also responsible for the physical verification of stocks and reconciling them with book figures. A store plays a vital role in the operations of a company.

4.Inventory control or management:

Inventory generally refers to the materials in stock. It is also called the idle resource of an enterprise. Inventories represent those items, which are either stocked for sale or they are in the process of manufacturing or they are in the form of materials, which are yet to be utilized. The interval between receiving the purchased parts and transforming them into final products varies from industries to industries depending upon the cycle time of manufacture. It is, therefore, necessary to hold inventories of various kinds to act as a buffer between supply and demand for the efficient operation of the system. Thus, effective control on inventory is a must for the smooth and efficient running of the production cycle with the least interruptions.

5.Other related activities (3S)

Standardization: Standardization means producing a maximum variety of products from the minimum variety of materials, parts, tools, and processes. It is the process of establishing standards or units of measure by which extent, quality, quantity, value, performance, etc. may be compared and measured.

Simplification: The concept of simplification is closely related to standardization. Simplification is the process of reducing the variety of products manufactured. Simplification is concerned with the reduction of product range, assemblies, parts, materials, and design.

Specifications: It refers to a precise statement that formalizes the requirements of the customer. It may relate to a product, process or service

8. Functions of Material Management

The functions of materials management can be categorized in the following ways:

- Material Planning and Control
 - Purchasing
 - Stores Management
 - Inventory Control or Management
 - Standardization
 - Simplification
 - Value Analysis
 - Ergonomics
 - Just-in-Time (JIT)
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9. Inventory management techniques

1. Bulk shipments

This method banks on the notion that it is almost always cheaper to purchase and ship goods in bulk. Bulk shipping is one of the predominant techniques in the industry, which can be applied for goods with high customer demand.

2. ABC inventory management

ABC inventory management is a technique that's based on putting products into categories in order of importance, with A being the most valuable and C being the least. Not all products are of equal value and more attention should be paid to more popular products.

3. Backordering

Backordering **refers to a company's decision to take orders and receive payments for out-of-stock products. It's a dream for most businesses but it can also be a logist** **4. Just in Time (JIT)**

4. Just In Time (JIT) inventory management lowers the volume of inventory that a business keeps on hand. It is considered a risky technique because you only purchase inventory a few days before it is needed for distribution or sale.

5. Consignment

Consignment involves a wholesaler placing stock in the hands of a retailer, but retaining ownership until the product is sold, at which point the retailer purchases the consumed stock.

Typically, selling on consignment involves a high degree of demand uncertainty from the retailer's point of view and a high degree of confidence from the wholesaler's point of view.

6. Dropshipping and cross-docking

This inventory management technique eliminates the cost of holding inventory altogether. When you have a dropshipping agreement, you can directly transfer customer orders and shipment details to your manufacturer or wholesaler, who then ships the goods.

10. Functions of a Store-Keeper.

The Store keeper is a responsible person and should be placed in a high position in the management hierarchy since he has to control the stores from every point of view. He is expected to help the cost department for its effective functioning.

- (i) To receive the materials from receiving department.
- (ii) To maintain proper records of stores.
- (iii) To make arrangement for proper storage of materials and finished goods.
- (iv) To issue materials to production departments against proper and authorised requisition.
- (v) To keep an eye on different stock levels and issue purchase requisition to the purchase department in time.
- (vi) To report on waste, scrap and obsolete stock.
- (vii) To prevent unauthorized persons from entering the stores.
- (viii) Periodic comparison of physical stocks and book figures and to reconcile the discrepancies, if any.
- (ix) To keep stores clean, tidy.
- (x) To make suitable arrangement for maintenance and preservation of the materials during storage.

