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Note: Attempt all the questions and submit to the Coordinator of your study centre. **Last date of submission for July 2022 session is 31st October, 2022 and for January 2023 session is 30th April, 2023.**

1. "Inventory hides problems and inefficiencies." Explain this preposition and highlight need for pull systems.
2. What do you understand by spare parts management? What are the challenges faced by production units while managing the spare parts?
3. Explain the concept of materials management. Also, explain why control is needed in materials management?
4. "To develop long term relations and to mutually benefit from them, amicable negotiations in a transaction are preferred." Comment on the statement.
5. "Understanding the types of production systems and layouts are necessary to minimize work in process (WIP)s, and their waiting and processing times. " Explain, in view of statement, the various types of production systems and layouts.

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1. “Inventory hides problems and inefficiencies.” Explain this proposition and highlight need for pull systems.

ANS: It has been noticed that inventory build up in process and manufacturing industries is often a sign of hidden problems, which lie underneath and are not visible at the surface level. In other words one can say that to cover up inefficiencies in the internal systems, people build up inventories as safety stocks. Stock build up can occur as a solution to cover up supplier inefficiencies. If the vendors are not reliable and the flow of raw materials cannot be ensured, there results a trend to hold buffer inventories in the form of raw materials or semi manufactured Work in Process inventories.

In other cases inventory build up can happen due to bad quality. The inventory cost increase and resultant inventory storage cost can be attributed to cost of quality. If the production is not consistent with quality, the goods produced will get rejected leading to an increase in rejected inventory. Secondly, to make up for the loss due to quality rejection, one would have to increase production and hold finished goods inventory.

In other cases production delays can lead to build up of inventories too. Production delays can be attributed to varied reasons such as bad design of the product, production layout inefficiencies, production stoppage due to breakdowns, Lengthy process times etc. Besides these causes, there could be many other problems related to people and management resulting in slackness on the shop floor, which can add to inventory holding at various stages.

Such inventory build-ups not only block the working capital and increase un necessary cost of maintaining and storing the inventories, but also hide the problems which can cause serious threat to the business. Management should be watchful to identify any such inventory buildups and investigate into the root cause and solve such problems.

An inventory build up at the raw material side as well as the finished goods side gives cause for worry to the finance controllers. Any non moving inventory is a cause for concern because it not only blocks up the funds of the organization but the incremental cost of holding the inventory keeps increasing over a period of time and effect the bottom line figures.

More importantly inventory over a period of time is susceptible to loss, theft, pilferage and shrinkage. It can also become obsolete and deteriorate over a period of time if not used within the shelf life.

Hence inventory levels are always on the radar of not only finance controllers, but of the top management as well.

In any company inventory management is one area that the managements always focus on when it comes to improving business efficiencies and cutting costs. An inventory reduction drive always yields results, which are visible and releases cash back into business. Does this mean that inventory

management is inefficient? The answer can be a yes and a no. Inventory management function is dependant upon physical operations involving multiple locations and agencies and processes. The inter dependence upon transactions which are sequential and parallel, renders inventory susceptible to inefficiencies occurring in operations, transactions, and documentation over a period of time.

Another possible factor that can hamper the inventory efficiencies is the system setup that is used to manage the inventory. Quite often one can find that the system setup and process defined in the system is not user friendly and cumbersome. An efficient system should define and guide the physical process as well as documentation process. The system process should in turn be developed based on the business process requirement. In many cases the operations are made to suit the system setup, which already exists in some basic form and not suited to the particular business process on hand.

Poor system setup that does not match with the shop floor warehouse set up renders operations inefficient. It is very common to come across complaints from users with regard to non-availability of features to work around the processes; at times processes are lengthy and cumbersome leading to operational delays. Non availability of different reports and loops and bugs in the system can often push the operations teams to find shortcut methods to by pass the system processes and carry on with the work, resulting in inventory inefficiencies as well as inefficient operations.

In cases where a company has outsourced the inventory management to a third party service provider, the inventory management complications increase manifold. You have the company's ERP or inventory system on one hand and the third part service providers inventory management system or warehouse system on the other hand. At any given point of time both have to be reflecting the same inventory accuracy and also match with physical stock available on shop floor, but this is not the case always. In cases where the systems are interfaced too inventory in one system cannot mirror the other and reconciling transactions between the two systems can be cumbersome and time consuming.

2. What do you understand by spare parts management? What are the challenges faced by production units while managing the spare parts?

ANS: spare parts management:

Spare Parts Management purpose is to provide "the right parts, in the right quantity, to the right place, at the right time, with the right level of quality, and at the least total cost to the organization". Effective management of maintenance spare parts is a critical contributor to equipment operating performance and to the cost of the maintenance investment.

The scope of Spare Parts Management therefore includes all functions from the supplier through to the point of use. – identification and coding, criticality classification, procurement, quality inspection, stocking policies, links to work planning (kitting, staging), supplier management and internal performance.

The basic aims of spare parts management are listed below, although the way it is implemented must be tailored to the specific characteristics of the factory.

Promote improvements such as standardization and unitization of components, longer working life, and better reliability, as an integral function of spare parts management.

To minimize downtime, ensure that parts required for breakdown repairs or planned maintenance are always available and ready for use.

Cut stock levels, prevent deterioration of parts in stock, and seek to reduce purchasing and storage costs, through effective management of technology and materials.

challenges faced by production units while managing the spare parts:

(1) Spare parts are often stored chaotically in separate departments, and new ones are mixed up with worn-out ones. The first step is to identify all unnecessary items and remove them.

(2) Reusable parts should always be refurbished before ordering new ones.

(3) Each part used should be considered to decide whether it should be kept permanently in stock or not, based on the following guidelines (see Figure “Deciding which Parts to Keep Permanently in Stock”):

Components required for unexpected breakdowns should be kept permanently in stock unless a standby machine is available.

As a rule, any spare part that can be planned for in advance should not be kept permanently in stock. However, if a part is used more than 3 or 4 times a year, it should be kept permanently in stock in order to reduce purchasing costs. Any parts whose delivery lead time is longer than the planned maintenance interval should also be kept permanently in stock.

Refurbished parts should be kept permanently in stock for use as spares.

(4) Deciding order points, order quantities, and order numbers required for routine management of permanently stocked parts

Maintenance materials can be managed on a fixed-quantity or fixed-number basis, depending on the form they take and how they are consumed. Fixed-number management is more common. To avoid stockouts, it is particularly important to set the minimum stock levels at values that allow for the maximum foreseeable variations in amounts used and delivery lead times. The maximum stock level is determined by the minimum stock level plus an order volume set according to the purchase frequency. If problems with parts storage are to be spotted and dealt with at an early stage, then the actual storage locations must be clearly labelled, showing the order points, order quantities, and order numbers (see Table “Consumption Models and Corresponding Standards”).

(5) Storage locations. These should be set up for ease of use, to minimize transportation and handling.

The frequency of use and restocking system employed for each part should be taken into account when deciding where it is to be stored. Specialized parts unique to a particular machine should be kept as close as possible to that machine. Duplication of storage should be avoided by having a centralized system for large common parts and a distributed storage system (with satellite stores in different locations) for small items.

3. Explain the concept of materials management. Also, explain why control is needed in materials management?

ANS: concept of materials management :

Materials Management is a method for planning, organizing and controlling the activities that are related to the flow of materials in a company. This can lead to the control of the location, movement and time of those materials from their introduction, production, manufacturing process and final delivery.

Materials management makes sure the materials available are aligned with the customer demands, thus giving a schedule of costs and resources that the company has or needs. Materials management controls the flow of materials with demand, prices, quality and delivery schedules.

Materials Management is vital for the process that is received from raw materials, machinery, production processes, maintenance, among others, because with this management you can order and classify the inventories in the most accurate way.

With the Management of Materials, one is responsible for the planning, movement, storage and control of materials to enhance and provide excellent customer service with a predetermined cost that is minimal.

OBJECTIVES OF MATERIAL MANAGEMENT:

1. Selection of the material

Correct selection of the required material, evaluation of this in sales with the sales department.

2 Low cost operation

Low operating costs and maintain profits without neglecting the quality offered to the customer.

Receive and control the material in a safe way and the good condition it must have. Identify the stock and take the production process to get the final product.

Fundamental Objectives of Materials Management

These objectives are called the 5 R's of Materials Management, they are the acquisition of materials and services.

- The right material
- At the right time
- In the right amount
- Of the quality that is At the right price
- From the right sources

control is needed in materials management :

Material control is the main component of the process of material management. Control over materials is of utmost importance for smooth and uninterrupted functioning of an organization. It can be defined as a systematic control over purchasing, storing and consumption of materials.

Importance:

- In a productive undertaking the need for materials control arises on account of the following reasons:
- For keeping the stock of raw materials within limits in the stores i.e., to avoid overstocking and under-stocking of raw materials, materials control is significant.
- It ensures proper storage of materials. For the proper preservation and safety of materials, adequate storage facilities are to be provided. With the help of proper storing of materials, quantity of materials as and when required can be issued to various jobs.
- For knowing the proper cost of production, control over materials is indispensable.
- Certain techniques and methods are developed under the system of materials control thereby ensuring optimum utilization of materials.

- In order to undertake continuous checking of materials, the necessity of a proper system of materials control cannot be ignored.
- A well-managed system of materials control ensures the availability of different kinds of materials without delay.
- There should be a proper co-operation and co-ordination among the departments dealing with material purchasing, receiving, testing, storing, production planning and accounting.
- Material control helps to maintain a regular and timely supply of materials by avoiding over and under-stocking. As already, pointed out while explaining the scope of material management that it includes purchases of materials storekeeping and inventory control etc.

4. “To develop long term relations and to mutually benefit from them, amicable negotiations in a transaction are preferred.” Comment on the statement.

ANS: Any dispute arising from the interpretation or performance of this Agreement must be settled by the Parties through amicable negotiation or by a third party through mediation, failing which, the case of dispute must be referred to arbitration organ within 30 days of the beginning of such negotiation. The service only works if the two of you can work together. You must be on speaking terms, be able to maintain positive eye contact with each other, stay emotionally controlled (most of the time!) and be prepared to be flexible (It's no good coming to the sessions with only one option – your preferred option).

Your coach will help facilitate agreements between you. Coaching sessions are all virtual. You can choose whether you want to be in the same room as your partner when you have your coaching sessions or whether you want to join the video call from separate locations.

Like any collaborative process the service only works when both people are willing to engage and behave in accordance with certain ground rules.

The amicable recovery and the arbitral recovery are extrajudicial remedies. In either case, everything begins with the delivery of reserves but also the claim notification. The latter is motivated by the survey report and to make the debate more coherent, subrogated insurer is required to bring back all the documents provided by his insured that will ease the negotiations so that he returns in his right; which is the reimbursement of the amount he has paid as payment of the indemnity to his insured.

The parties agree that, both during and after the performance of their responsibilities under this Agreement, each of them will make bona fide efforts to resolve any disputes arising between them via amicable negotiations;

Any claims, differences or disputes arising out of or in connection with this Agreement (“Dispute”), including any question regarding its existence, validity, termination or its performance, or in connection with arrangements regarding the performance of this Agreement shall first be attempted to be settled by an amicable effort on the part of the parties, which shall include a meeting between the Presidents of both parties or their designees. An attempt to arrive at a settlement shall be deemed to have failed as soon as one of the parties so notifies the other party in writing.

The Parties agree that, both during and after the term of Executive's employment, each Party will make bona fide efforts to resolve any disputes by amicable negotiations;

At the written request of a Party, each Party will appoint a knowledgeable, responsible representative to meet and negotiate in good faith to resolve any dispute arising out of or relating to this Agreement. The Parties intend that these negotiations be conducted by non-lawyer, business representatives. The location, format, frequency, duration, and conclusion of these discussions shall be left to the discretion of the representatives. Upon agreement, the representatives may utilize other alternative dispute resolution procedures such as mediation to assist in the negotiations. Discussions and correspondence among the representatives for purposes of these negotiations shall be treated as confidential information developed for purposes of settlement, exempt from discovery, and shall not be admissible in the arbitration described below or in any lawsuit without the concurrence of all Parties. Documents identified in or provided with such communications, which are not prepared for purposes of the negotiations, are not so exempted and may, if otherwise discoverable, be discovered or otherwise admissible, be admitted in evidence, in the arbitration or lawsuit.

5. “Understanding the types of production systems and layouts are necessary to minimize work in process (WIP)s, and their waiting and processing times. “ Explain, in view of statement, the various types of production systems and layouts

ANS: Four types of facility layouts:

Process layout:

The focus of the process layout is the production process or it arranges the workflow according to the process. In this layout, workers or departments performing similar tasks are grouped together. Unfinished goods move from one workstation to another.

At each position, there is a group of workers carrying out a specific type of task.

Product layout:

In the product or assembly line layout people, equipment, or departments are arranged along an assembly line for production of high volume goods.

Assembly line means a series of workstations at which already made parts are assembled.

Such layouts are used for products requiring a continuous or repetitive production process.

When the manufacturing firm needs to produce large volumes of a product on an ongoing basis, it arranges workstations or departments in a line and the product moves along the assembly line.

Cellular layout:

The previous two layouts arrange the workflow by function.

However, this is not always the most efficient and effective method since sometimes inventory may build up and workers might grow bored of doing repetitive tasks and time may also be wasted transporting goods from one workstation to another.

Some of these problems are overcome using the cellular layout.

In the cellular layout different functions or departments are not carrying out different tasks.

Fixed position layout:

While it is easier to move around toys and candies what about the products that cannot be moved about easily or on conveyor belts? For example, what about planes and ships?

Such production firms adopt a fixed position layout where the product remains in one place and the worker and equipment are moved around as needed.

Not just the manufacturers of ships and airplanes, but the construction firms also use a fixed position layout.

WIP:

Work in Progress (WIP) is any inventory that has entered the manufacturing process but is not yet a finished product. Reducing WIP is one of the most important steps in achieving lean manufacturing, leading to smoother workflow, greater liquidity, and overall improved performance of a team's production.

Ways To Reduce WIP in Manufacturing

1. Just in Time Manufacturing (JIT)

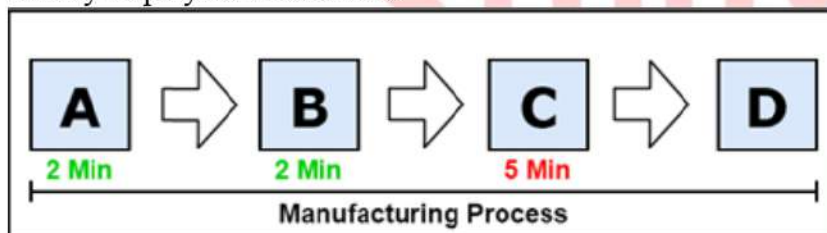
Just in time manufacturing is a method of production where materials are only brought in and used as they are required in the manufacturing process. JIT is a fantastic way to reduce many types of waste, especially surplus. The purpose of this method is to get rid of overproduction, waiting, and excess inventory - three of the eight types of waste.

By minimizing these types of waste, manufacturers will have a quicker turnover which reduces the amount of money tied up in materials.

2. Locate Bottlenecks

A bottleneck is a stage in the manufacturing process that is scheduled to complete more objectives than it can produce at maximum capacity. A bottleneck can be as simple as a slow Wi-Fi connection or waiting for approval to proceed with a project.

When a bottleneck occurs, it slows down the work process and requires employees to work overtime or sacrifice other tasks. Removing these bottlenecks will reduce the WIP time, maximizing output. These bottlenecks can be removed by allocating more resources to that stage, usually employees or materials.



When the Work in Progress enters stage C, the manufacturing process will get backed up – this is the bottleneck.

3. Coordinate

Make sure that employees are all focused on a common goal. All employees should understand each part of the manufacturing process, allowing them to perform their respective tasks more efficiently. Workers can better set up the processes that follow and precede them, resulting in faster task completion. With small amounts of time saved in each step, manufacturing WIP is reduced greatly.

4. Upgrade

Upgrading employees and machinery are some of the best ways to reduce WIP in manufacturing environments. The first and most cost-effective step is to offer training. By creating in-depth training sessions and instructions on how to perform tasks, employees will master their trade, reducing WIP. While it is important to have skillful employees, they are only as fast as the tools allow them to be.

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Training employees will go to waste unless their materials allow them to perform tasks at a good pace, so upgrading the tools that they work with is key. Keeping equipment up to par is often the most vital part of reducing WIP. Other methods of improvement include hiring more employees, fixing network issues, and offering incentives to employees.

5. Organize

One of the most common bottlenecks is disorganization. Out of 18,000 business leaders, 57% said they lose six working hours per week as a result of disorganization.¹ Disorganization can come in many ways, whether it be tools, parts, or information. Any disarray will negatively affect the WIP in manufacturing and cause delays in the process.

One of the most common solutions to this problem in manufacturing is to provide guidelines on which places items should go, along with how many. Labeling storage bins and organizing them will help solve organization issues. By knowing exactly where materials are, transitional time can be reduced so more time is spent on work.

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